Table of Contents
Section II – Soil and Site Information

**County specific computer generated reports.*

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Logan County, Kansas: Maintenance needed

Map symbol	Soil name	Acres	Percent
063CC	Campus-Canlon Complex, 3 To 40 Percent Slopes	5	*
063EC	Elkader Silt Loam, 3 To 6 Percent Slopes	198	*
063ED	Elkader And Manvel Silt Loams, 6 To 15 Percent Slopes	491	*
063IN	Inavale Soils, Frequently Flooded	10	*
063MB	Manvel-Badland Complex, 6 To 40 Percent Slopes	735	0.1
063RB	Roxbury Soils, Frequently Flooded	1,004	0.1
063UD	Ulysses Silt Loam, 6 To 10 Percent Slopes	5,970	0.9
063UE	Ulysses-Colby Complex, 2 To 6 Percent Slopes	1	*
171AN	Bridgeport Loam, Channeled	775	0.1
171MM	Campus-Canlon Loams, 5 To 30 Percent Slopes	4,012	0.6
181RH	Kim-Otero Complex, 6 To 25 Percent Slopes	284	*
193CD	Colby Silt Loam, 7 To 15 Percent Slopes	923	0.1
193US	Ulysses Silt Loam, 3 To 7 Percent Slopes	68	*
199BB	Bankard Loamy Sand, Occasionally Flooded	39	*
199BC	Bankard Sandy Loam, Rarely Flooded	13	*
199BO	Bridgeport Loam, Occasionally Flooded	361	*
199BP	Bridgeport Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded	2,676	0.4
199CD	Canyon Loam, 5 To 30 Percent Slopes	119	*
199KO	Kim-Otero Complex, 5 To 20 Percent Slopes	173	*
199KU	Kuma Silt Loam, 0 To 1 Percent Slopes	669	*
199MC	Manter Fine Sandy Loam, 2 To 5 Percent Slopes	52	*
203MM	Campus-Canlon Complex, 3 To 25 Percent Slopes	160	*
An	Bridgeport Silt Loam, Channeled	6,454	0.9
Bl	Badland	1,959	0.3
Bp	Bridgeport Loam, Rarely Flooded	9,050	1.3
Bv	Angelus Silt Loam, Occasionally Flooded	2,619	0.4
CAA	Caruso Loam, Occasionally Flooded	407	*
Cc	Colby Silt Loam, 3 To 5 Percent Slopes	1,827	0.3
Cd	Colby Silt Loam, 5 To 15 Percent Slopes	61,373	8.9
COD	Colby Silt Loam, 6 To 15 Percent Slopes	11,526	1.7
Dw	Dwyer Loamy Fine Sand, 3 To 8 Percent Slopes	1,779	0.3
Ea	Elkader Silt Loam, 0 To 1 Percent Slopes	993	0.1
Eb	Elkader Silt Loam, 1 To 3 Percent Slopes	5,278	0.8
Ec	Elkader Silt Loam, 3 To 5 Percent Slopes	8,062	1.2
Ed	Elkader Silt Loam, 5 To 15 Percent Slopes	9,229	1.3
Gr	Schamber Gravelly Sandy Loam, 5 To 25 Percent Slopes	3,342	0.5
Ka	Keith Silt Loam, 0 To 1 Percent Slopes	138,800	20.2
Kb	Keith Silt Loam, 1 To 3 Percent Slopes	13,118	1.9
Lb	Las Loam, Moderately Deep, Occasionally Flooded	2,143	0.3
Ld	Las Animas Sandy Loam, Occasionally Flooded	2,078	0.3
Lk	Likes Loamy Fine Sand, 0 To 2 Percent Slopes	689	0.1
Ll	Lincoln Soils, Occasionally Flooded	2,910	0.4
Lm	Midway Clay, 5 To 30 Percent Slopes	10,727	1.6
Ln	Simeon Loamy Sand, 5 To 15 Percent Slopes	9,462	1.4
Lo	Pleasant Silty Clay Loam, 0 To 1 Percent Slopes	377	*
Lu	Lubbock Silt Loam, 0 To 1 Percent Slopes	1,379	0.2
Mh	Manter Fine Sandy Loam, 1 To 3 Percent Slopes	1,334	0.2
Mk	Manter Fine Sandy Loam, 3 To 5 Percent Slopes	473	*
Mn	Manvel Silt Loam, 1 To 5 Percent Slopes	6,959	1.0
Mp	Minnequa-Penrose Silt Loams, 5 To 15 Percent Slopes	17,792	2.6
Ot	Otero Fine Sandy Loam, 4 To 15 Percent Slopes	3,152	0.5
Po	Canyon Loam, 5 To 35 Percent Slopes	3,401	0.5
Pr	Limon Clay, 0 To 1 Percent Slopes	875	0.1
Ps	Limon Clay, 1 To 3 Percent Slopes	810	0.1
Pt	Razor Clay, 3 To 5 Percent Slopes	511	*
Ra	Ness Clay	979	0.1
Rc	Richfield Silt Loam, 0 To 1 Percent Slopes	1,081	0.2
SMH	Smoky Hill River	3,147	0.5
Ua	Ulysses Silt Loam, 0 To 1 Percent Slopes	91,258	13.3
Ub	Ulysses Silt Loam, 1 To 3 Percent Slopes	149,058	21.7
Uc	Ulysses Silt Loam, 3 To 5 Percent Slopes	45,573	6.6
UCC	Ulysses Silt Loam, 3 To 6 Percent Slopes	2,613	0.4
Ud	Ulysses Silt Loam, 5 To 15 Percent Slopes	14,841	2.2
Uh	Ulysses Silty Clay Loam, 1 To 3 Slopes	1,411	0.2
Ul	Ulysses-Colby Silt Loams, 3 To 5 Percent Slopes, Eroded	9,362	1.4
Um	Ulysses-Colby Silt Loams, 5 To 15 Percent Slopes, Eroded	2,985	0.4
Vl	Goshen Silt Loam, Rarely Flooded	4,038	0.6
Vs	Goshen-Drummond Complex, Rarely Flooded	257	*
W	Water	167	*
Wa	Sweetwater Clay Loam, Occasionally Flooded	469	*
	Total	686,865	100.0

* Less than 0.1 percent.

NONTECHNICAL SOIL DESCRIPTIONS
Logan County, Kansas

Nontechnical soil descriptions describe soil properties or management considerations specific to a soil map unit or group of map units, shown in the NonTechnical Descriptions report. These descriptions are written in terminology that Non-technical users of soil survey information can understand.
Nontechnical soil descriptions are a powerful tool for creating reports. These high quality, easy to read reports can be generated by conservation planners and other NRCS employees for distribution to land users. Soil map unit descriptions and National Soil Information System records are the basis for these descriptions.

063CC Campus-Canlon Complex, 3 To 40 Percent Slopes

Campus soil makes up 60 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of old calcareous fine-loamy alluvium and/or calcareous fine-loamy residuum. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 45 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Canlon soil makes up 40 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep escarpment on upland. The runoff class is high. The parent material consists of calcareous loamy residuum weathered from sandstone. The soil is 10 to 20 inches deep to bedrock (lithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 25 percent calcium carbonate. This soil is in the Shallow Limy (pe16-20) range site. It is in the nonirrigated land capability classification 7s.

063EC Elkader Silt Loam, 3 To 6 Percent Slopes

Elkader soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping fan on upland. The runoff class is medium. The parent material consists of calcareous silty residuum. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 50 percent calcium carbonate. This soil contains a moderately saline horizon, This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 3e.

063ED Elkader And Manvel Silt Loams, 6 To 15 Percent Slopes

Elkader soil makes up 55 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep fan on upland. The runoff class is medium. The parent material consists of calcareous silty residuum. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 50 percent calcium carbonate. This soil contains a moderately saline horizon, This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Manvel soil makes up 45 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping fan on upland. The runoff class is medium. The parent material consists of calcareous fine-silty colluvium derived from chalk. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 20 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Chalk Flats (pe16-20) range site. This soil is in the irrigated land capability class 4e. It is in the nonirrigated land capability classification 6e.

063IN Inavale Soils, Frequently Flooded

Inavale soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is somewhat excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sandy Lowland (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 4e.

063MB Manvel-Badland Complex, 6 To 40 Percent Slopes

Manvel soil makes up 65 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping fan on upland. The runoff class is medium. The parent material consists of calcareous fine-silty colluvium derived from chalk. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 20 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Chalk Flats (pe16-20) range site. This soil is in the irrigated land capability class 4e. It is in the nonirrigated land capability classification 6e.

Badland soil makes up 35 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep erosion remnant on badlands. The runoff class is high. The parent material consists of calcareous residuum weathered from chalk. The soil is 0 to 3 inches deep to bedrock (paralithic). This soil is excessively drained. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification .

063RB Roxbury Soils, Frequently Flooded

Roxbury soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of calcareous fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Lowland (pe16-20) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

063UC Ulysses Silt Loam, 3 To 6 Percent Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping plain on tableland. The runoff class is low. The parent material consists of loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 3e.

063UD Ulysses Silt Loam, 6 To 10 Percent Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

063UE Ulysses-Colby Complex, 2 To 6 Percent Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping hillslope on upland. The runoff class is low. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 4e.

171AN Bridgeport Loam, Channeled

Bridgeport soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Lowland (pe16-20) range site. It is in the nonirrigated land capability classification 5w.

171MM Campus-Canlon Loams, 5 To 30 Percent Slopes

Campus soil makes up 75 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on tableland. The runoff class is medium. The parent material consists of old calcareous fine-loamy alluvium and/or calcareous fine-loamy residuum. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Sandy (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Canlon soil makes up 25 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep break on tableland. The runoff class is high. The parent material consists of calcareous loamy residuum weathered from sandstone. The soil is 10 to 21 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Shallow Limy (pe16-20) range site. It is in the nonirrigated land capability classification 7s.

181RH Kim-Otero Complex, 6 To 25 Percent Slopes

Rough Broken Land soil makes up 65 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. <runoff is missing> The parent material consists of alluvium over eolian deposits derived from sandstone and shale. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Gravelly Land soil makes up 35 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep hillslope on upland. <runoff is missing> The parent material consists of coarse-loamy eolian deposits. This soil is well drained. The slowest permeability is moderately rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Gravelly Hills (pe16-20) range site. This soil is in the irrigated land capability class 6e. It is in the nonirrigated land capability classification 6e.

193CD Colby Silt Loam, 7 To 15 Percent Slopes

Colby soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of calcareous fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

193US Ulysses Silt Loam, 3 To 7 Percent Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 3e.

199BB Bankard Loamy Sand, Occasionally Flooded

Bankard soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is somewhat excessively drained. The slowest permeability is rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sands (pe16-20) range site. This soil is in the irrigated land capability class 4w. It is in the nonirrigated land capability classification 6w.

199BC Bankard Sandy Loam, Rarely Flooded

Bankard soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is very low. The parent material consists of sandy alluvium. This soil is somewhat excessively drained. The slowest permeability is moderately rapid. It has a low available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sandy (pe16-20) range site. This soil is in the irrigated land capability class 4w. It is in the nonirrigated land capability classification 4w.

199BO Bridgeport Loam, Occasionally Flooded

Bridgeport soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is low. The parent material consists of calcareous fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Lowland (pe16-20) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

199BP Bridgeport Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded

Bridgeport soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on alluvial plain. The runoff class is low. The parent material consists of calcareous fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Terrace (pe20-26) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.

199CD Canyon Loam, 5 To 30 Percent Slopes

Canyon soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep hillslope on upland. The runoff class is high. The parent material consists of calcareous loamy residuum weathered from limestone and sandstone. The soil is 6 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 40 percent calcium carbonate. This soil is in the Shallow Limy (pe16-20) range site. It is in the nonirrigated land capability classification 6s.

199CP Colby Silt Loam, 6 To 15 Percent Slopes

Colby soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of calcareous fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

199KO Kim-Otero Complex, 5 To 20 Percent Slopes

Kim soil makes up 70 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of alluvium and/or eolian deposits derived from sandstone and shale. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Otero soil makes up 30 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep summit hillslope on upland. The runoff class is low. The parent material consists of coarse-loamy eolian deposits. This soil is well drained. The slowest permeability is moderately rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Sandy (pe16-20) range site. This soil is in the irrigated land capability class 6e. It is in the nonirrigated land capability classification 6e.

199KU Kuma Silt Loam, 0 To 1 Percent Slopes

Kuma soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level flat on upland. The runoff class is low. The parent material consists of calcareous fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 3c.

199MC Manter Fine Sandy Loam, 2 To 5 Percent Slopes

Manter soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping plain on upland. The runoff class is very low. The parent material consists of calcareous alluvium and/or calcareous eolian deposits. This soil is well drained. The slowest permeability is moderately rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sandy (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 4e.

203MM Campus-Canlon Complex, 3 To 25 Percent Slopes

Campus soil makes up 60 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep plain on tableland. The runoff class is medium. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Canlon soil makes up 40 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep plain on tableland. The runoff class is medium. The parent material consists of calcareous loamy residuum weathered from sandstone. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderate. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Shallow Limy (pe16-20) range site. It is in the nonirrigated land capability classification 6s.

An Bridgeport Silt Loam, Channeled

Bridgeport soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to gently sloping terrace on river valley. The runoff class is low. The parent material consists of calcareous fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Lowland (pe16-20) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 2w.

Bp Bridgeport Loam, Rarely Flooded

Bridgeport soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to gently sloping alluvial fan on alluvial plain, flood plain on alluvial plain. The runoff class is low. The parent material consists of calcareous fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Terrace (pe16-20) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.

Bv Angelus Silt Loam, Occasionally Flooded

Angelus soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is low. The parent material consists of silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Lowland (pe16-20) range site. It is in the nonirrigated land capability classification 4w.

CAA Caruso Loam, Occasionally Flooded

Caruso soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of fine-loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is moderately slow. It has a high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 30 inches. The soil contains a maximum amount of 5 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Subirrigated (pe16-20) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 3w.

Cc Colby Silt Loam, 3 To 5 Percent Slopes

Colby soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is low. The parent material consists of calcareous fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 4e.

Cd Colby Silt Loam, 5 To 15 Percent Slopes

Colby soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep drainageway on upland. The runoff class is medium. The parent material consists of calcareous fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

COD Colby Silt Loam, 6 To 15 Percent Slopes

Colby soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of calcareous fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Dw Dwyer Loamy Fine Sand, 3 To 8 Percent Slopes

Dwyer soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep dune on upland. The runoff class is very low. The parent material consists of calcareous sandy eolian deposits. This soil is excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Sands (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Logan County, Kansas

Ea Elkader Silt Loam, 0 To 1 Percent Slopes

Elkader soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level flat on upland. The runoff class is low. The parent material consists of calcareous silty residuum weathered from chalk. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 50 percent calcium carbonate. This soil contains a moderately saline horizon, This soil is in the Limy Upland (pe16-20) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.

Eb Elkader Silt Loam, 1 To 3 Percent Slopes

Elkader soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping fan on upland. The runoff class is low. The parent material consists of calcareous silty residuum weathered from chalk. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 50 percent calcium carbonate. This soil contains a moderately saline horizon, This soil is in the Limy Upland (pe16-20) range site. This soil is in the irrigated land capability class 2e. It is in the nonirrigated land capability classification 2e.

Ec Elkader Silt Loam, 3 To 5 Percent Slopes

Elkader soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is low. The parent material consists of calcareous silty residuum weathered from chalk. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 50 percent calcium carbonate. This soil contains a moderately saline horizon, This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 3e.

Ed Elkader Silt Loam, 5 To 15 Percent Slopes

Elkader soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of calcareous silty residuum weathered from chalk. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 50 percent calcium carbonate. This soil contains a moderately saline horizon, This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Gr Schamber Gravelly Sandy Loam, 5 To 25 Percent Slopes

Schamber soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep drainageway on upland. The runoff class is low. The parent material consists of sandy and gravelly alluvium. This soil is somewhat excessively drained. The slowest permeability is rapid. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Gravelly Hills (pe16-20) range site. It is in the nonirrigated land capability classification 6s.

Ka Keith Silt Loam, 0 To 1 Percent Slopes

Keith soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level plain on upland. The runoff class is negligible. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.

Kb Keith Silt Loam, 1 To 3 Percent Slopes

Keith soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping plain on upland. The runoff class is low. The parent material consists of fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 2e. It is in the nonirrigated land capability classification 2e.

Lb Las Loam, Moderately Deep, Occasionally Flooded

Las soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is low. The parent material consists of fine-loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is moderately slow. It has a moderate available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 30 inches. The soil contains a maximum amount of 10 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Loamy Lowland (pe16-20) range site. This soil is in the irrigated land capability class 2w. It is in the nonirrigated land capability classification 4w.

Ld Las Animas Sandy Loam, Occasionally Flooded

Las Animas soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of loamy and/or sandy alluvium. This soil is somewhat poorly drained. The slowest permeability is moderately rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 27 inches. The soil contains a maximum amount of 5 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Sandy Lowland (pe16-20) range site. This soil is in the irrigated land capability class 3w. It is in the nonirrigated land capability classification 3w.

Lk Likes Loamy Fine Sand, 0 To 2 Percent Slopes

Likes soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping fan on upland. The runoff class is negligible. The parent material consists of sandy alluvium and/or sandy eolian deposits. This soil is excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sands (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Ll Lincoln Soils, Occasionally Flooded

Lincoln soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is somewhat excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 66 inches. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sandy Lowland (pe16-20) range site. It is in the nonirrigated land capability classification 6w.

Lm Midway Clay, 5 To 30 Percent Slopes

Midway soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep hillslope on upland. The runoff class is very high. The parent material consists of calcareous residuum weathered from calcareous shale. The soil is 6 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is slow. It has a very low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil contains a slightly saline horizon, This soil is in the Shale Breaks (pe16-20) range site. This soil is in the irrigated land capability class 4e. It is in the nonirrigated land capability classification 6e.

Ln Simeon Loamy Sand, 5 To 15 Percent Slopes

Simeon soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep drainageway on upland. The runoff class is very low. The parent material consists of sandy and gravelly alluvium. This soil is excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Shallow Limy (pe16-20) range site. It is in the nonirrigated land capability classification 6s.

Lo Pleasant Silty Clay Loam, 0 To 1 Percent Slopes

Pleasant soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to 0.000000 playa on tableland. The runoff class is negligible. The parent material consists of clayey alluvium and/or eolian deposits. This soil is poorly drained. The slowest permeability is very slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is occasional ponded. The top of the seasonal high water table is at 0 inches. The soil contains a maximum amount of 2 percent calcium carbonate. This soil is in the Lakebed (pe16-20) range site. It is in the nonirrigated land capability classification 4w.

Lu Lubbock Silt Loam, 0 To 1 Percent Slopes

Lubbock soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level alluvial flat on upland. The runoff class is low. The parent material consists of reworked by wind alluvium. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.

Mh Manter Fine Sandy Loam, 1 To 3 Percent Slopes

Manter soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping sand sheet on paleoterrace on tableland. The runoff class is very low. The parent material consists of loamy eolian deposits. This soil is well drained. The slowest permeability is moderately rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sandy (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 3e.

Mk Manter Fine Sandy Loam, 3 To 5 Percent Slopes

Manter soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping plain on upland. The runoff class is very low. The parent material consists of calcareous alluvium and/or calcareous eolian deposits. This soil is well drained. The slowest permeability is moderately rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sandy (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 4e.

Mn Manvel Silt Loam, 1 To 5 Percent Slopes

Manvel soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping fan on upland. The runoff class is low. The parent material consists of calcareous fine-silty colluvium derived from chalk. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 20 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Chalk Flats (pe16-20) range site. This soil is in the irrigated land capability class 4e. It is in the nonirrigated land capability classification 4e.

Mp Minnequa-Penrose Silt Loams, 5 To 15 Percent Slopes

Minnequa soil makes up 60 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping fan on upland. The runoff class is medium. The parent material consists of calcareous fine-silty colluvium derived from chalk. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 25 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Chalk Flats (pe16-20) range site. This soil is in the irrigated land capability class 4e. It is in the nonirrigated land capability classification 6e.

Penrose soil makes up 40 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep hillslope on upland. The runoff class is medium. The parent material consists of loamy residuum weathered from limestone and sandstone. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Shallow Limy (pe16-20) range site. It is in the nonirrigated land capability classification 6s.

Ot Otero Fine Sandy Loam, 4 To 15 Percent Slopes

Otero soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is low. The parent material consists of coarse-loamy eolian deposits. This soil is well drained. The slowest permeability is moderately rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil contains a very slightly saline horizon, This soil is in the Sandy (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 4e.

Po Canyon Loam, 5 To 35 Percent Slopes

Canyon soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to steep escarpment on upland. The runoff class is medium. The parent material consists of calcareous loamy residuum weathered from limestone and sandstone. The soil is 6 to 20 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 40 percent calcium carbonate. This soil is in the Shallow Limy (pe16-20) range site. It is in the nonirrigated land capability classification 6s.

Pr Limon Clay, 0 To 1 Percent Slopes

Limon soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level to moderately sloping fan remnant on upland. The runoff class is high. The parent material consists of clayey alluvium derived from clayey shale. This soil is well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil contains a slightly saline horizon, This soil is in the Clay Upland (pe16-20) range site. This soil is in the irrigated land capability class 3s. It is in the nonirrigated land capability classification 6e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Logan County, Kansas

Ps Limon Clay, 1 To 3 Percent Slopes

Limon soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping fan remnant on upland. The runoff class is high. The parent material consists of clayey alluvium derived from clayey shale. This soil is well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil contains a slightly saline horizon, This soil is in the Clay Upland (pe16-20) range site. This soil is in the irrigated land capability class 4e. It is in the nonirrigated land capability classification 6s.

Pt Razor Clay, 3 To 5 Percent Slopes

Razor soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is high. The parent material consists of residuum weathered from calcareous shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil contains a moderately saline horizon, it has a horizon that is moderately sodic. This soil is in the Clay Upland (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 6e.

Ra Ness Clay

Ness soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level playa on tableland. The runoff class is negligible. The parent material consists of clayey alluvium and/or eolian deposits. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is occasional ponded. The top of the seasonal high water table is at 0 inches. The soil contains a maximum amount of 2 percent calcium carbonate. This soil is in the Lakebed (pe16-20) range site. It is in the nonirrigated land capability classification 6w.

Rc Richfield Silt Loam, 0 To 1 Percent Slopes

Richfield soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level plain on tableland. The runoff class is low. The parent material consists of loess. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 20 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.

Ua Ulysses Silt Loam, 0 To 1 Percent Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level ridge on upland. The runoff class is low. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.

Ub Ulysses Silt Loam, 1 To 3 Percent Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping ridge on upland. The runoff class is low. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 2e. It is in the nonirrigated land capability classification 2e.

Uc Ulysses Silt Loam, 3 To 5 Percent Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is low. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 3e.

UCC Ulysses Silt Loam, 3 To 6 Percent Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping plain on tableland. The runoff class is low. The parent material consists of loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 3e.

Ud Ulysses Silt Loam, 5 To 15 Percent Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Uh Ulysses Silty Clay Loam, 1 To 3 Slopes

Ulysses soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a gently sloping ridge on upland. The runoff class is low. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. This soil is in the irrigated land capability class 2e. It is in the nonirrigated land capability classification 2e.

Ul Ulysses-Colby Silt Loams, 3 To 5 Percent Slopes, Eroded

Ulysses soil makes up 70 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is low. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 4e.

Colby soil makes up 30 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is low. The parent material consists of calcareous fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 4e.

Um Ulysses-Colby Silt Loams, 5 To 15 Percent Slopes, Eroded

Ulysses soil makes up 60 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of fine-silty calcareous loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Loamy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Colby soil makes up 40 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is medium. The parent material consists of calcareous fine-silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 15 percent calcium carbonate. This soil is in the Limy Upland (pe16-20) range site. It is in the nonirrigated land capability classification 6e.

Vl Goshen Silt Loam, Rarely Flooded

Goshen soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level terrace on river valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Terrace (pe16-20) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.

Vs Goshen-Drummond Complex, Rarely Flooded

Goshen soil makes up 70 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level terrace on river valley. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Terrace (pe16-20) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.

Drummond soil makes up 30 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level terrace on river valley. The runoff class is low. The parent material consists of clayey and/or loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a low available water capacity and a high shrink swell potential. This soil is rarely flooded and is not ponded. The top of the seasonal high water table is at 48 inches. This soil contains a slightly saline horizon, It is in the nonirrigated land capability classification 5s.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Logan County, Kansas

Wa Sweetwater Clay Loam, Occasionally Flooded

Sweetwater soil makes up 100 percent of the map unit. This map unit is in the Central High Tableland Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is low. The parent material consists of fine-loamy alluvium over sandy alluvium. This soil is poorly drained. The slowest permeability is moderately slow. It has a moderate available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 21 inches. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Saline Subirrigated (pe16-20) range site. It is in the nonirrigated land capability classification 5w.

063CC—Campus-Canlon complex, 3 to 40 percent slopes

Map Unit Composition

Campus: 60 percent
Canlon: 40 percent

Component Descriptions

Campus
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Old calcareous fine-loamy alluvium and/or calcareous fine-loamy residuum
Slope: 3 to 10 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 5.4 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 5 inches; silty clay loam
H2—5 to 20 inches; clay loam
H3—20 to 30 inches; loam
R—30 to 30 inches; unweathered bedrock

Canlon
MLRA: 72 - Central High Tableland
Landform: Escarpment on upland
Parent material: Calcareous loamy residuum weathered from sandstone
Slope: 3 to 40 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 2.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Shallow Limy (pe16-20)
Land capability (nonirrigated): 7s

Typical Profile:
H1—0 to 4 inches; loam
H2—4 to 15 inches; loam
R—15 to 15 inches; unweathered bedrock

Minor Components
Unnamed Hydric Soils

063EC—Elkader silt loam, 3 to 6 percent slopes

Map Unit Composition

Elkader: 100 percent

Component Descriptions

Elkader
MLRA: 72 - Central High Tableland
Landform: Fan on upland
Parent material: Calcareous silty residuum
Slope: 3 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.6 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 9 inches; silt loam
H2—9 to 20 inches; silt loam
H3—20 to 60 inches; silt loam

063ED—Elkader And Manvel silt loams, 6 to 15 percent slopes

Map Unit Composition

Elkader: 55 percent
Manvel: 45 percent

Component Descriptions

Elkader
MLRA: 72 - Central High Tableland
Landform: Fan on upland
Parent material: Calcareous silty residuum
Slope: 6 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.6 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 9 inches; silt loam
H2—9 to 20 inches; silt loam
H3—20 to 60 inches; silt loam

Manvel
MLRA: 72 - Central High Tableland
Landform: Fan on upland
Parent material: Calcareous fine-silty colluvium derived from chalk
Slope: 6 to 10 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 10.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Chalk Flats (pe16-20)
Land capability (irrigated): 4e
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 3 inches; silt loam
H2—3 to 60 inches; silt loam

063IN—Inavale Soils, frequently flooded

Map Unit Composition

Inavale: 100 percent

Component Descriptions

Inavale
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Sandy alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat excessively drained
Slowest permeability: Rapid (About 6.00 in/hr)
Available water capacity: Low (About 5.0 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Sandy Lowland (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 7 inches; loamy sand
H2—7 to 18 inches; loamy sand
H3—18 to 60 inches; loamy sand

063MB—Manvel-Badland complex, 6 to 40 percent slopes

Map Unit Composition

Manvel: 65 percent
Badland: 35 percent

Component Descriptions

Manvel
MLRA: 72 - Central High Tableland
Landform: Fan on upland
Parent material: Calcareous fine-silty colluvium derived from chalk
Slope: 6 to 10 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 10.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Chalk Flats (pe16-20)
Land capability (irrigated): 4e
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 3 inches; silt loam
H2—3 to 60 inches; silt loam

Badland
MLRA: 72 - Central High Tableland
Landform: Erosion remnant on badlands
Parent material: Calcareous residuum weathered from chalk
Slope: 6 to 40 percent
Depth to restrictive feature: 0 to 3 inches to bedrock (paralithic)
Drainage class: Excessively drained
Depth to seasonal water saturation: More than 6 feet
Runoff class: High

Typical Profile:
C—0 to 1 inches; silt loam

063RB—Roxbury Soils, frequently flooded

Map Unit Composition

Roxbury: 100 percent

Component Descriptions

Roxbury
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Calcareous fine-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.5 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe16-20)
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical Profile:
H1—0 to 24 inches; silt loam
H2—24 to 39 inches; silty clay loam
H3—39 to 60 inches; silt loam

Minor Components
Unnamed Hydric Soils

063UC—Ulysses silt loam, 3 to 6 percent slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Plain on tableland
Parent material: Loess
Slope: 3 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 6 inches; silt loam
H2—6 to 16 inches; silty clay loam
H3—16 to 60 inches; silt loam

063UD—Ulysses silt loam, 6 to 10 percent slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland

Parent material: Fine-silty calcareous loess
Slope: 6 to 10 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 10 inches; silt loam
H2—10 to 60 inches; silt loam

063UE—Ulysses-Colby complex, 2 to 6 percent slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Fine-silty calcareous loess
Slope: 2 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 10 inches; silt loam
H2—10 to 60 inches; silt loam

171AN—Bridgeport loam, channeled

Map Unit Composition

Bridgeport: 100 percent

Component Descriptions

Bridgeport
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe16-20)
Land capability (nonirrigated): 5w

Typical Profile:
H1—0 to 12 inches; loam
H2—12 to 60 inches; loam

171MM—Campus-Canlon loams, 5 to 30 percent slopes

Map Unit Composition

Campus: 75 percent
Canlon: 25 percent

Component Descriptions

Campus
MLRA: 72 - Central High Tableland
Landform: Hillslope on tableland
Parent material: Old calcareous fine-loamy alluvium and/or calcareous fine-loamy residuum
Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 5.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Sandy (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 7 inches; loam
H2—7 to 16 inches; clay loam
H3—16 to 28 inches; clay loam
R—28 to 28 inches; unweathered bedrock

Canlon
MLRA: 72 - Central High Tableland
Landform: Break on tableland
Parent material: Calcareous loamy residuum weathered from sandstone
Slope: 5 to 40 percent
Depth to restrictive feature: 10 to 21 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 4.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Shallow Limy (pe16-20)
Land capability (nonirrigated): 7s

Typical Profile:
H1—0 to 5 inches; loam
H2—5 to 21 inches; gravelly loam
R—21 to 21 inches; unweathered bedrock

181RH—Kim-Otero complex, 6 to 25 percent slopes

Map Unit Composition

Rough Broken Land: 65 percent
Gravelly Land: 35 percent

Component Descriptions

Rough Broken Land
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Alluvium over eolian deposits derived from sandstone and shale
Slope: 6 to 20 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 9.5 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 6 inches; loam
H2—6 to 60 inches;

Gravelly Land
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Coarse-loamy eolian deposits
Slope: 6 to 25 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Moderate (About 6.2 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Ecological site: Gravelly Hills (pe16-20)
Land capability (irrigated): 6e
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 14 inches; sandy loam
H2—14 to 60 inches;

Minor Components
Unnamed Hydric Soils

193CD—Colby silt loam, 7 to 15 percent slopes

Map Unit Composition

Colby: 100 percent

Component Descriptions

Colby
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous fine-silty loess
Slope: 7 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 4 inches; silt loam
H2—4 to 60 inches; silt loam

193US—Ulysses silt loam, 3 to 7 percent slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Fine-silty calcareous loess
Slope: 3 to 7 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 7 inches; silt loam
H2—7 to 17 inches; silt loam
H3—17 to 60 inches; silt loam

199BB—Bankard loamy sand, occasionally flooded

Map Unit Composition

Bankard: 100 percent

Component Descriptions

Bankard
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Sandy alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat excessively drained
Slowest permeability: Rapid (About 6.00 in/hr)
Available water capacity: Moderate (About 6.6 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Sands (pe16-20)
Land capability (irrigated): 4w
Land capability (nonirrigated): 6w

Typical Profile:
H1—0 to 5 inches; loamy sand
H2—5 to 60 inches;

199BC—Bankard sandy loam, rarely flooded

Map Unit Composition

Bankard: 100 percent

Component Descriptions

Bankard
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Sandy alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat excessively drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Low (About 4.5 inches)

Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Sandy (pe16-20)
Land capability (irrigated): 4w
Land capability (nonirrigated): 4w

Typical Profile:
H1—0 to 5 inches; sandy loam
H2—5 to 60 inches;

199BO—Bridgeport loam, occasionally flooded

Map Unit Composition

Bridgeport: 100 percent

Component Descriptions

Bridgeport
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Calcareous fine-silty alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe16-20)
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical Profile:
H1—0 to 16 inches; loam
H2—16 to 60 inches; silt loam

Minor Components
Unnamed Hydric Soils

199BP—Bridgeport silt loam, 0 to 2 percent slopes, rarely flooded

Map Unit Composition

Bridgeport: 100 percent

Component Descriptions

Bridgeport
MLRA: 72 - Central High Tableland
Landform: Flood plain on alluvial plain
Parent material: Calcareous fine-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 13.0 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Terrace (pe20-26)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
H1—0 to 13 inches; silt loam
H2—13 to 60 inches; silt loam

199CD—Canyon loam, 5 to 30 percent slopes

Map Unit Composition

Canyon: 100 percent

Component Descriptions

Canyon
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous loamy residuum weathered from limestone and sandstone
Slope: 5 to 30 percent
Depth to restrictive feature: 6 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 2.5 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High

Ecological site: Shallow Limy (pe16-20)
Land capability (nonirrigated): 6s

Typical Profile:
H1—0 to 4 inches; loam
H2—4 to 14 inches; gravelly loam
Cr—14 to 14 inches; weathered bedrock

Minor Components
Unnamed Hydric Soils

199CP—Colby silt loam, 6 to 15 percent slopes

Map Unit Composition

Colby: 100 percent

Component Descriptions

Colby
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous fine-silty loess
Slope: 6 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 5 inches; silt loam
H2—5 to 60 inches; silt loam

199KO—Kim-Otero complex, 5 to 20 percent slopes

Map Unit Composition

Kim: 70 percent
Otero: 30 percent

Component Descriptions

Kim
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Alluvium and/or eolian deposits derived from sandstone and shale
Slope: 5 to 20 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 9.5 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 6 inches; loam
H2—6 to 60 inches; clay loam

Otero
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Hillslope position: Summit
Parent material: Coarse-loamy eolian deposits
Slope: 5 to 20 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Moderate (About 6.0 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sandy (pe16-20)
Land capability (irrigated): 6e
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 5 inches; sandy loam
H2—5 to 60 inches; sandy loam

199KU—Kuma silt loam, 0 to 1 percent slopes

Map Unit Composition

Kuma: 100 percent

Component Descriptions

Kuma
MLRA: 72 - Central High Tableland
Landform: Flat on upland
Parent material: Calcareous fine-silty loess
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.8 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 1
Land capability (nonirrigated): 3c

Typical Profile:
H1—0 to 8 inches; silt loam
H2—8 to 25 inches; silty clay loam
H3—25 to 60 inches;

Minor Components
Pleasant

199MC—Manter fine sandy loam, 2 to 5 percent slopes

Map Unit Composition

Manter: 100 percent

Component Descriptions

Manter
MLRA: 72 - Central High Tableland
Landform: Plain on upland
Parent material: Calcareous alluvium and/or calcareous eolian deposits
Slope: 2 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Moderate (About 7.4 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Sandy (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 16 inches; fine sandy loam
H2—16 to 36 inches; sandy loam
H3—36 to 60 inches; sandy loam

203MM—Campus-Canlon complex, 3 to 25 percent slopes

Map Unit Composition

Campus: 60 percent
Canlon: 40 percent

Component Descriptions

Campus
MLRA: 72 - Central High Tableland
Landform: Plain on tableland
Parent material: Residuum
Slope: 3 to 15 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 5.4 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 8 inches; loam
H2—8 to 30 inches; loam
R—30 to 30 inches; unweathered bedrock

Canlon
MLRA: 72 - Central High Tableland
Landform: Plain on tableland
Parent material: Calcareous loamy residuum weathered from sandstone
Slope: 3 to 25 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)

Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 0.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Shallow Limy (pe16-20)
Land capability (nonirrigated): 6s

Typical Profile:
H1—0 to 4 inches; loam
R—4 to 4 inches; unweathered bedrock

An—Bridgeport silt loam, channeled

Map Unit Composition

Bridgeport: 100 percent

Component Descriptions

Bridgeport
MLRA: 72 - Central High Tableland
Landform: Terrace on river valley
Parent material: Calcareous fine-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.0 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe16-20)
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical Profile:
H1—0 to 12 inches; silt loam
H2—12 to 60 inches;

Bl—Badland

Map Unit Composition

Badland: 100 percent

Component Descriptions

Badland
MLRA: 72 - Central High Tableland
Landform: Erosion remnant on badlands
Parent material: Calcareous residuum weathered from chalk
Depth to seasonal water saturation: More than 6 feet

Bp—Bridgeport loam, rarely flooded

Map Unit Composition

Bridgeport: 100 percent

Component Descriptions

Bridgeport
MLRA: 72 - Central High Tableland
Landform: Flood plain on alluvial plain, alluvial fan on alluvial plain
Parent material: Calcareous fine-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 13.0 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Terrace (pe16-20)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
H1—0 to 18 inches; loam
H2—18 to 60 inches; loam

Bv—Angelus silt loam, occasionally flooded

Map Unit Composition

Angelus: 100 percent

Component Descriptions

Angelus
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Silty alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe16-20)
Land capability (nonirrigated): 4w

Typical Profile:
H1—0 to 6 inches; silt loam
H2—6 to 60 inches; loam

CAA—Caruso loam, occasionally flooded

Map Unit Composition

Caruso: 100 percent

Component Descriptions

Caruso
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Fine-loamy alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.5 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 24 to 36 inches
Runoff class: Low
Ecological site: Subirrigated (pe16-20)
Land capability (irrigated): 2w
Land capability (nonirrigated): 3w

Typical Profile:
H1—0 to 16 inches; loam
H2—16 to 60 inches; loam

Minor Components
Sweetwater

Cc—Colby silt loam, 3 to 5 percent slopes

Map Unit Composition

Colby: 100 percent

Component Descriptions

Colby
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous fine-silty loess
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Limy Upland (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 5 inches; silt loam
H2—5 to 60 inches; silt loam

Cd—Colby silt loam, 5 to 15 percent slopes

Map Unit Composition

Colby: 100 percent

Component Descriptions

Colby
MLRA: 72 - Central High Tableland
Landform: Drainageway on upland
Parent material: Calcareous fine-silty loess
Slope: 5 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 5 inches; silt loam
H2—5 to 60 inches; silt loam

COD—Colby silt loam, 6 to 15 percent slopes

Map Unit Composition

Colby: 100 percent

Component Descriptions

Colby
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous fine-silty loess
Slope: 6 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 5 inches; silt loam
H2—5 to 60 inches; silt loam

Dw—Dwyer loamy fine sand, 3 to 8 percent slopes

Map Unit Composition

Dwyer: 100 percent

Component Descriptions

Dwyer
MLRA: 72 - Central High Tableland
Landform: Dune on upland
Parent material: Calcareous sandy eolian deposits
Slope: 6 to 20 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (About 6.00 in/hr)
Available water capacity: Low (About 4.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Sands (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 5 inches; loamy fine sand
H2—5 to 60 inches; fine sand

Ea—Elkader silt loam, 0 to 1 percent slopes

Map Unit Composition

Elkader: 100 percent

Component Descriptions

Elkader
MLRA: 72 - Central High Tableland
Landform: Flat on upland
Parent material: Calcareous silty residuum weathered from chalk
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.7 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Limy Upland (pe16-20)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
H1—0 to 15 inches; silt loam
H2—15 to 23 inches; silt loam
H3—23 to 60 inches; silt loam

Eb—Elkader silt loam, 1 to 3 percent slopes

Map Unit Composition

Elkader: 100 percent

Component Descriptions

Elkader
MLRA: 72 - Central High Tableland
Landform: Fan on upland
Parent material: Calcareous silty residuum weathered from chalk
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.7 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Limy Upland (pe16-20)
Land capability (irrigated): 2e
Land capability (nonirrigated): 2e

Typical Profile:
H1—0 to 15 inches; silt loam
H2—15 to 23 inches; silt loam
H3—23 to 60 inches; silt loam

Ec—Elkader silt loam, 3 to 5 percent slopes

Map Unit Composition

Elkader: 100 percent

Component Descriptions

Elkader
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous silty residuum weathered from chalk
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.7 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 15 inches; silt loam
H2—15 to 23 inches; silt loam
H3—23 to 60 inches; silt loam

Ed—Elkader silt loam, 5 to 15 percent slopes

Map Unit Composition

Elkader: 100 percent

Component Descriptions

Elkader
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous silty residuum weathered from chalk

Slope: 5 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.7 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 15 inches; silt loam
H2—15 to 23 inches; silt loam
H3—23 to 60 inches; silt loam

Gr—Schamber gravelly sandy loam, 5 to 25 percent slopes

Map Unit Composition

Schamber: 100 percent

Component Descriptions

Schamber
MLRA: 72 - Central High Tableland
Landform: Drainageway on upland
Parent material: Sandy and gravelly alluvium
Slope: 5 to 25 percent
Drainage class: Somewhat excessively drained
Slowest permeability: Rapid (About 6.00 in/hr)
Available water capacity: Very low (About 3.0 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Gravelly Hills (pe16-20)
Land capability (nonirrigated): 6s

Typical Profile:
H1—0 to 6 inches; gravelly sandy loam
H2—6 to 60 inches;

Ka—Keith silt loam, 0 to 1 percent slopes

Map Unit Composition

Keith: 100 percent

Component Descriptions

Keith
MLRA: 72 - Central High Tableland
Landform: Plain on upland
Parent material: Fine-silty loess
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.3 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
H1—0 to 11 inches; silt loam
H2—11 to 32 inches; silty clay loam
H3—32 to 60 inches; silt loam

Minor Components
Lofton

Kb—Keith silt loam, 1 to 3 percent slopes

Map Unit Composition

Keith: 100 percent

Component Descriptions

Keith
MLRA: 72 - Central High Tableland
Landform: Plain on upland
Parent material: Fine-silty loess
Slope: 1 to 3 percent

Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.3 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 2e
Land capability (nonirrigated): 2e

Typical Profile:
H1—0 to 11 inches; silt loam
H2—11 to 31 inches; silt loam
H3—31 to 60 inches; silt loam

Minor Components
Pleasant

Lb—Las loam, moderately deep, occasionally flooded

Map Unit Composition

Las: 100 percent

Component Descriptions

Las
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Fine-loamy alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Moderate (About 7.3 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 24 to 36 inches
Runoff class: Low
Ecological site: Loamy Lowland (pe16-20)
Land capability (irrigated): 2w
Land capability (nonirrigated): 4w

Typical Profile:
H1—0 to 8 inches; loam
H2—8 to 32 inches; clay loam
H3—32 to 60 inches; coarse sand

Minor Components
Wet Alluvial Land

Ld—Las Animas sandy loam, occasionally flooded

Map Unit Composition

Las Animas: 100 percent

Component Descriptions

Las Animas
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Loamy and/or sandy alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Moderate (About 7.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 18 to 36 inches
Runoff class: Negligible
Ecological site: Sandy Lowland (pe16-20)
Land capability (irrigated): 3w
Land capability (nonirrigated): 3w

Typical Profile:
H1—0 to 29 inches; fine sandy loam
H2—29 to 35 inches; loamy fine sand
H3—35 to 60 inches; fine sand

Lk—Likes loamy fine sand, 0 to 2 percent slopes

Map Unit Composition

Likes: 100 percent

Component Descriptions

Likes
MLRA: 72 - Central High Tableland

Landform: Fan on upland
Parent material: Sandy alluvium and/or sandy eolian deposits
Slope: 1 to 2 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (About 6.00 in/hr)
Available water capacity: Low (About 3.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Sands (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 10 inches; loamy fine sand
H2—10 to 60 inches; loamy sand

Ll—Lincoln Soils, occasionally flooded

Map Unit Composition

Lincoln: 100 percent

Component Descriptions

Lincoln
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Sandy alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat excessively drained
Slowest permeability: Rapid (About 6.00 in/hr)
Available water capacity: Low (About 3.3 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 60 to 72 inches
Runoff class: Negligible
Ecological site: Sandy Lowland (pe16-20)
Land capability (nonirrigated): 6w

Typical Profile:
H1—0 to 10 inches; loamy sand
H2—10 to 60 inches; gravelly coarse sand

Lm—Midway clay, 5 to 30 percent slopes

Map Unit Composition

Midway: 100 percent

Component Descriptions

Midway
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous residuum weathered from calcareous shale
Slope: 5 to 30 percent
Depth to restrictive feature: 6 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Very low (About 1.9 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Ecological site: Shale Breaks (pe16-20)
Land capability (irrigated): 4e
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 2 inches; clay
H2—2 to 12 inches; gravelly clay
Cr—12 to 16 inches; weathered bedrock

Ln—Simeon loamy sand, 5 to 15 percent slopes

Map Unit Composition

Simeon: 100 percent

Component Descriptions

Simeon
MLRA: 72 - Central High Tableland
Landform: Drainageway on upland
Parent material: Sandy and gravelly alluvium
Slope: 5 to 15 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (About 6.00 in/hr)

Available water capacity: Low (About 5.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Shallow Limy (pe16-20)
Land capability (nonirrigated): 6s

Typical Profile:
H1—0 to 12 inches; loamy sand
H2—12 to 60 inches;

Lo—Pleasant silty clay loam, 0 to 1 percent slopes

Map Unit Composition

Pleasant: 100 percent

Component Descriptions

Pleasant
MLRA: 72 - Central High Tableland
Landform: Playa on tableland
Parent material: Clayey alluvium and/or eolian deposits
Slope: 0 to 0 percent
Drainage class: Poorly drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: High (About 10.2 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Ponding hazard: Occasional
Depth to seasonal water saturation: About 0 to 0 inches
Runoff class: Negligible
Ecological site: Lakebed (pe16-20)
Land capability (nonirrigated): 4w

Typical Profile:
H1—0 to 8 inches; silty clay loam
H2—8 to 43 inches; silty clay loam
H3—43 to 60 inches; silty clay loam

Lu—Lubbock silt loam, 0 to 1 percent slopes

Map Unit Composition

Lubbock: 100 percent

Component Descriptions

Lubbock
MLRA: 72 - Central High Tableland
Landform: Alluvial flat on upland
Parent material: Reworked by wind alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 10.3 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
H1—0 to 10 inches; silt loam
H2—10 to 28 inches; silty clay loam
H3—28 to 60 inches; silty clay loam

Minor Components
Lofton

Mh—Manter fine sandy loam, 1 to 3 percent slopes

Map Unit Composition

Manter: 100 percent

Component Descriptions

Manter
MLRA: 72 - Central High Tableland
Landform: Sand sheet on paleoterrace on tableland
Parent material: Loamy eolian deposits
Slope: 1 to 3 percent

Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Moderate (About 7.3 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Sandy (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 17 inches; fine sandy loam
H2—17 to 36 inches; loam
H3—36 to 50 inches; loam

Mk—Manter fine sandy loam, 3 to 5 percent slopes

Map Unit Composition

Manter: 100 percent

Component Descriptions

Manter
MLRA: 72 - Central High Tableland
Landform: Plain on upland
Parent material: Calcareous alluvium and/or calcareous eolian deposits
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Moderate (About 7.2 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Sandy (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 14 inches; fine sandy loam
H2—14 to 26 inches; sandy loam
H3—26 to 60 inches; sandy loam

Mn—Manvel silt loam, 1 to 5 percent slopes

Map Unit Composition

Manvel: 100 percent

Component Descriptions

Manvel
MLRA: 72 - Central High Tableland
Landform: Fan on upland
Parent material: Calcareous fine-silty colluvium derived from chalk
Slope: 1 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 10.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Chalk Flats (pe16-20)
Land capability (irrigated): 4e
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 3 inches; silt loam
H2—3 to 60 inches; silt loam

Mp—Minnequa-Penrose silt loams, 5 to 15 percent slopes

Map Unit Composition

Minnequa: 60 percent
Penrose: 40 percent

Component Descriptions

Minnequa
MLRA: 72 - Central High Tableland
Landform: Fan on upland
Parent material: Calcareous fine-silty colluvium derived from chalk
Slope: 5 to 9 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 5.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Chalk Flats (pe16-20)
Land capability (irrigated): 4e
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 3 inches; silt loam
H2—3 to 30 inches; silt loam
H3—30 to 60 inches; weathered bedrock

Penrose
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Loamy residuum weathered from limestone and sandstone
Slope: 6 to 25 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 2.0 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Shallow Limy (pe16-20)
Land capability (nonirrigated): 6s

Typical Profile:
H1—0 to 6 inches; loam
H2—6 to 12 inches; silt loam
Cr—12 to 12 inches; unweathered bedrock

Ot—Otero fine sandy loam, 4 to 15 percent slopes

Map Unit Composition

Otero: 100 percent

Component Descriptions

Otero
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Coarse-loamy eolian deposits
Slope: 3 to 8 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Moderate (About 6.2 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sandy (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 16 inches; fine sandy loam
H2—16 to 60 inches;

Po—Canyon loam, 5 to 35 percent slopes

Map Unit Composition

Canyon: 100 percent

Component Descriptions

Canyon
MLRA: 72 - Central High Tableland
Landform: Escarpment on upland
Parent material: Calcareous loamy residuum weathered from limestone and sandstone
Slope: 5 to 35 percent
Depth to restrictive feature: 6 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 2.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Shallow Limy (pe16-20)

Land capability (nonirrigated): 6s

Typical Profile:
H1—0 to 5 inches; loam
H2—5 to 12 inches; gravelly loam
Cr—12 to 12 inches; weathered bedrock

Minor Components
Unnamed Hydric Soils

Pr—Limon clay, 0 to 1 percent slopes

Map Unit Composition

Limon: 100 percent

Component Descriptions

Limon
MLRA: 72 - Central High Tableland
Landform: Fan remnant on upland
Parent material: Clayey alluvium derived from clayey shale
Slope: 0 to 6 percent
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Moderate (About 8.4 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Clay Upland (pe16-20)
Land capability (irrigated): 3s
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 8 inches; clay
H2—8 to 60 inches; clay

Ps—Limon clay, 1 to 3 percent slopes

Map Unit Composition

Limon: 100 percent

Component Descriptions

Limon
MLRA: 72 - Central High Tableland
Landform: Fan remnant on upland
Parent material: Clayey alluvium derived from clayey shale
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Moderate (About 8.4 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Clay Upland (pe16-20)
Land capability (irrigated): 4e
Land capability (nonirrigated): 6s

Typical Profile:
H1—0 to 8 inches; clay
H2—8 to 60 inches; clay

Pt—Razor clay, 3 to 5 percent slopes

Map Unit Composition

Razor: 100 percent

Component Descriptions

Razor
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Residuum weathered from calcareous shale
Slope: 3 to 5 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Moderate (About 6.8 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Clay Upland (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 8 inches; clay
H2—8 to 20 inches; clay

H3—20 to 40 inches; clay
Cr—40 to 40 inches; weathered bedrock

Ra—Ness clay

Map Unit Composition

Ness: 100 percent

Component Descriptions

Ness
MLRA: 72 - Central High Tableland
Landform: Playa on tableland
Parent material: Clayey alluvium and/or eolian deposits
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 7.7 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Ponding hazard: Occasional
Depth to seasonal water saturation: About 0 to 0 inches
Runoff class: Negligible
Ecological site: Lakebed (pe16-20)
Land capability (nonirrigated): 6w

Typical Profile:
H1—0 to 60 inches; clay

Rc—Richfield silt loam, 0 to 1 percent slopes

Map Unit Composition

Richfield: 100 percent

Component Descriptions

Richfield
MLRA: 72 - Central High Tableland
Landform: Plain on tableland
Parent material: Loess
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.3 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
H1—0 to 5 inches; silt loam
H2—5 to 27 inches; silty clay loam
H3—27 to 60 inches; silt loam

SMH—Smoky Hill River

Map Unit Composition

Smoky Hill River: 100 percent

Component Descriptions

Smoky Hill River
MLRA: 72 - Central High Tableland
Slope: 0 to 4 percent
Slowest permeability: Rapid (About 6.00 in/hr)
Available water capacity: Very low (About 2.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 0 to 72 inches
Land capability (nonirrigated): 8w

Minor Components
Unnamed Hydric Soils

Ua—Ulysses silt loam, 0 to 1 percent slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Ridge on upland
Parent material: Fine-silty calcareous loess
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
H1—0 to 7 inches; silt loam
H2—7 to 25 inches; silt loam
H3—25 to 60 inches; silt loam

Ub—Ulysses silt loam, 1 to 3 percent slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Ridge on upland
Parent material: Fine-silty calcareous loess
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 2e
Land capability (nonirrigated): 2e

Typical Profile:
H1—0 to 7 inches; silt loam
H2—7 to 25 inches; silt loam
H3—25 to 60 inches; silt loam

Uc—Ulysses silt loam, 3 to 5 percent slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Fine-silty calcareous loess
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 7 inches; silt loam
H2—7 to 25 inches; silt loam
H3—25 to 60 inches; silt loam

UCC—Ulysses silt loam, 3 to 6 percent slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses

MLRA: 72 - Central High Tableland
Landform: Plain on tableland
Parent material: Loess
Slope: 3 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 3e

Typical Profile:
H1—0 to 6 inches; silt loam
H2—6 to 16 inches; silty clay loam
H3—16 to 60 inches; silt loam

Ud—Ulysses silt loam, 5 to 15 percent slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Fine-silty calcareous loess
Slope: 5 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 7 inches; silt loam
H2—7 to 25 inches; silt loam
H3—25 to 60 inches; silt loam

Uh—Ulysses silty clay loam, 1 To 3 Slopes

Map Unit Composition

Ulysses: 100 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Ridge on upland
Parent material: Fine-silty calcareous loess
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.8 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (irrigated): 2e
Land capability (nonirrigated): 2e

Typical Profile:
H1—0 to 6 inches; silty clay loam
H2—6 to 16 inches; silt loam
H3—16 to 60 inches; silt loam

Ul—Ulysses-Colby silt loams, 3 to 5 percent slopes, eroded

Map Unit Composition

Ulysses: 70 percent
Colby: 30 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland

Parent material: Fine-silty calcareous loess
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe16-20)
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 7 inches; silt loam
H2—7 to 25 inches; silt loam
H3—25 to 60 inches; silt loam

Colby
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous fine-silty loess
Slope: 3 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Limy Upland (pe16-20)
Land capability (irrigated): 3e
Land capability (nonirrigated): 4e

Typical Profile:
H1—0 to 5 inches; silt loam
H2—5 to 60 inches; silt loam

Um—Ulysses-Colby silt loams, 5 to 15 percent slopes, eroded

Map Unit Composition

Ulysses: 60 percent
Colby: 40 percent

Component Descriptions

Ulysses
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Fine-silty calcareous loess
Slope: 5 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 12.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 7 inches; silt loam
H2—7 to 25 inches; silt loam
H3—25 to 60 inches; silt loam

Colby
MLRA: 72 - Central High Tableland
Landform: Hillslope on upland
Parent material: Calcareous fine-silty loess
Slope: 5 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Limy Upland (pe16-20)
Land capability (nonirrigated): 6e

Typical Profile:
H1—0 to 5 inches; silt loam
H2—5 to 60 inches; silt loam

Vl—Goshen silt loam, rarely flooded

Map Unit Composition

Goshen: 100 percent

Component Descriptions

Goshen
MLRA: 72 - Central High Tableland
Landform: Terrace on river valley
Parent material: Fine-silty alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Terrace (pe16-20)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
H1—0 to 16 inches; silt loam
H2—16 to 26 inches; silty clay loam
H3—26 to 60 inches; silt loam

Vs—Goshen-Drummond complex, rarely flooded

Map Unit Composition

Goshen: 70 percent
Drummond: 30 percent

Component Descriptions

Goshen
MLRA: 72 - Central High Tableland
Landform: Terrace on river valley
Parent material: Fine-silty alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Terrace (pe16-20)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
H1—0 to 16 inches; silt loam
H2—16 to 26 inches; silty clay loam
H3—26 to 60 inches; silt loam

Drummond
MLRA: 72 - Central High Tableland
Landform: Terrace on river valley
Parent material: Clayey and/or loamy alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Low (About 3.5 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: About 24 to 72 inches
Runoff class: Low
Land capability (nonirrigated): 5s

Typical Profile:
H1—0 to 5 inches; silt loam
H2—5 to 26 inches;
H3—26 to 60 inches;

W—Water

Map Unit Composition

Water: 100 percent

Component Descriptions

Water
MLRA: 72 - Central High Tableland
Depth to seasonal water saturation: More than 6 feet

Typical Profile:

Wa—Sweetwater clay loam, occasionally flooded

Map Unit Composition

Sweetwater: 100 percent

Component Descriptions

Sweetwater
MLRA: 72 - Central High Tableland
Landform: Flood plain on river valley
Parent material: Fine-loamy alluvium over sandy alluvium
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Moderate (About 6.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 6 to 36 inches
Runoff class: Low
Ecological site: Saline Subirrigated (pe16-20)
Land capability (nonirrigated): 5w

Typical Profile:
H1—0 to 24 inches; clay loam
H2—24 to 60 inches;

PRIME FARMLAND
Logan County, Kansas

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short− and long−range needs for food and fiber. Because the supply of high−quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built−up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in the following table. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in the "Acres and Proportionate Extent of Soils" table. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described in other tables in this document."

PRIME FARMLAND--Continued
Logan County, Kansas : Maintenance needed

Map symbol	Mapunit name	Farmland Classification
199BP	Bridgeport silt loam, 0 to 2 percent slopes, rarely flooded	All areas are prime farmland
Kb	Keith silt loam, 1 to 3 percent slopes	All areas are prime farmland
063RB	Roxbury soils, frequently flooded	Prime farmland if irrigated
063UE	Ulysses-colby complex, 2 to 6 percent slopes	Prime farmland if irrigated
193US	Ulysses silt loam, 3 to 7 percent slopes	Prime farmland if irrigated
199BC	Bankard sandy loam, rarely flooded	Prime farmland if irrigated
199BO	Bridgeport loam, occasionally flooded	Prime farmland if irrigated
199KU	Kuma silt loam, 0 to 1 percent slopes	Prime farmland if irrigated
CAA	Caruso loam, occasionally flooded	Prime farmland if irrigated
Ka	Keith silt loam, 0 to 1 percent slopes	Prime farmland if irrigated
Lu	Lubbock silt loam, 0 to 1 percent slopes	Prime farmland if irrigated
Rc	Richfield silt loam, 0 to 1 percent slopes	Prime farmland if irrigated
Ua	Ulysses silt loam, 0 to 1 percent slopes	Prime farmland if irrigated
Ub	Ulysses silt loam, 1 to 3 percent slopes	Prime farmland if irrigated
Uc	Ulysses silt loam, 3 to 5 percent slopes	Prime farmland if irrigated
UCC	Ulysses silt loam, 3 to 6 percent slopes	Prime farmland if irrigated
Uh	Ulysses silty clay loam, 1 to 3 slopes	Prime farmland if irrigated
Vl	Goshen silt loam, rarely flooded	Prime farmland if irrigated

SOIL RATING FOR PLANT GROWTH, modified 1998
Logan County, Kansas

The "Soil Rating for Plant Growth, modified 1998" (SRPG) is a relative rating of the capacity of a soil to produce a specific plant under a defined management system. The index is determined from yield data on a few benchmark soils and is used to calculate yields, the net returns from crops, land assessment values, and taxes and to perform risk analysis when land management decisions are made. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Map symbol	Soil name	Crop Index
063CC	Campus-Canlon Complex, 3 To 40 Percent Slopes	16
063EC	Elkader Silt Loam, 3 To 6 Percent Slopes	30
063ED	Elkader And Manvel Silt Loams, 6 To 15 Percent Slopes	31
063IN	Inavale Soils, Frequently Flooded	22
063MB	Manvel-Badland Complex, 6 To 40 Percent Slopes	23
063RB	Roxbury Soils, Frequently Flooded	56
063UC	Ulysses Silt Loam, 3 To 6 Percent Slopes	47
063UD	Ulysses Silt Loam, 6 To 10 Percent Slopes	52
063UE	Ulysses-Colby Complex, 2 To 6 Percent Slopes	55
171AN	Bridgeport Loam, Channeled	41
171MM	Campus-Canlon Loams, 5 To 30 Percent Slopes	16
181RH	Kim-Otero Complex, 6 To 25 Percent Slopes	30
193CD	Colby Silt Loam, 7 To 15 Percent Slopes	41
193US	Ulysses Silt Loam, 3 To 7 Percent Slopes	52
199BB	Bankard Loamy Sand, Occasionally Flooded	22
199BC	Bankard Sandy Loam, Rarely Flooded	23
199BO	Bridgeport Loam, Occasionally Flooded	51
199BP	Bridgeport Silt Loam, 0 To 2 Percent Slopes, Rarely Flooded	54
199CD	Canyon Loam, 5 To 30 Percent Slopes	4
199CP	Colby Silt Loam, 6 To 15 Percent Slopes	42
199KO	Kim-Otero Complex, 5 To 20 Percent Slopes	32
199KU	Kuma Silt Loam, 0 To 1 Percent Slopes	59
199MC	Manter Fine Sandy Loam, 2 To 5 Percent Slopes	42
203MM	Campus-Canlon Complex, 3 To 25 Percent Slopes	12
An	Bridgeport Silt Loam, Channeled	50
Bl	Badland	0
Bp	Bridgeport Loam, Rarely Flooded	52
Bv	Angelus Silt Loam, Occasionally Flooded	42
CAA	Caruso Loam, Occasionally Flooded	53
COD	Colby Silt Loam, 6 To 15 Percent Slopes	42
Cc	Colby Silt Loam, 3 To 5 Percent Slopes	46
Cd	Colby Silt Loam, 5 To 15 Percent Slopes	42
Dw	Dwyer Loamy Fine Sand, 3 To 8 Percent Slopes	18
Ea	Elkader Silt Loam, 0 To 1 Percent Slopes	30
Eb	Elkader Silt Loam, 1 To 3 Percent Slopes	30
Ec	Elkader Silt Loam, 3 To 5 Percent Slopes	29
Ed	Elkader Silt Loam, 5 To 15 Percent Slopes	26
Gr	Schamber Gravelly Sandy Loam, 5 To 25 Percent Slopes	14
Ka	Keith Silt Loam, 0 To 1 Percent Slopes	60
Kb	Keith Silt Loam, 1 To 3 Percent Slopes	60
Lb	Las Loam, Moderately Deep, Occasionally Flooded	41
Ld	Las Animas Sandy Loam, Occasionally Flooded	39
Lk	Likes Loamy Fine Sand, 0 To 2 Percent Slopes	19
Ll	Lincoln Soils, Occasionally Flooded	14
Lm	Midway Clay, 5 To 30 Percent Slopes	3
Ln	Simeon Loamy Sand, 5 To 15 Percent Slopes	24
Lo	Pleasant Silty Clay Loam, 0 To 1 Percent Slopes	4
Lu	Lubbock Silt Loam, 0 To 1 Percent Slopes	59
Mh	Manter Fine Sandy Loam, 1 To 3 Percent Slopes	45
Mk	Manter Fine Sandy Loam, 3 To 5 Percent Slopes	40
Mn	Manvel Silt Loam, 1 To 5 Percent Slopes	36
Mp	Minnequa-Penrose Silt Loams, 5 To 15 Percent Slopes	14
Ot	Otero Fine Sandy Loam, 4 To 15 Percent Slopes	29
Po	Canyon Loam, 5 To 35 Percent Slopes	3
Pr	Limon Clay, 0 To 1 Percent Slopes	33
Ps	Limon Clay, 1 To 3 Percent Slopes	34
Pt	Razor Clay, 3 To 5 Percent Slopes	30
Ra	Ness Clay	11
Rc	Richfield Silt Loam, 0 To 1 Percent Slopes	54
SMH	Smoky Hill River	0
UCC	Ulysses Silt Loam, 3 To 6 Percent Slopes	47
Ua	Ulysses Silt Loam, 0 To 1 Percent Slopes	54
Ub	Ulysses Silt Loam, 1 To 3 Percent Slopes	53
Uc	Ulysses Silt Loam, 3 To 5 Percent Slopes	52
Ud	Ulysses Silt Loam, 5 To 15 Percent Slopes	46
Uh	Ulysses Silty Clay Loam, 1 To 3 Slopes	52
Ul	Ulysses-Colby Silt Loams, 3 To 5 Percent Slopes, Eroded	50
Um	Ulysses-Colby Silt Loams, 5 To 15 Percent Slopes, Eroded	45
Vl	Goshen Silt Loam, Rarely Flooded	60
Vs	Goshen-Drummond Complex, Rarely Flooded	49
W	Water	0
Wa	Sweetwater Clay Loam, Occasionally Flooded	36

Logan County, Kansas: Maintenance needed
Field Office Thunderbook: Soils Properties for Conservation Planning

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "K", "Kf", "Wind Erodibility Group" and "Wind Erodibility Index" apply only to the surface layer)

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
063CC:CAMPUS----	60	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.28	.28	2	4L	86
063CC:CANLON----	40	N/A	7s	Not prime farmland	D	Shallow Limy (pe16-20)	5	.32	.32	1	4L	86
063EC:ELKADER---	100	N/A	3e	Not prime farmland	B	Limy Upland (pe16-20)	5	.32	.32	4	4L	86
063ED:ELKADER---	55	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.32	.32	4	4L	86
063ED:MANVEL----	45	4e-	6e	Not prime farmland	B	Chalk Flats (pe16-20)	5	.37	.37	5	4L	86
063IN:INAVALE---	100	3e-	4e	Not prime farmland	A	Sandy Lowland (pe16-20)	2	.17	.17	5	2	134
063MB:MANVEL----	65	4e-	6e	Not prime farmland	B	Chalk Flats (pe16-20)	5	.37	.37	5	4L	86
063MB:BADLAND---	35	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
063RB:ROXBURY---	100	2w-	2w	Prime farmland if irrigated	B	Loamy Lowland (pe16-20)	5	.32	.32	5	4L	86
063UC:ULYSSES---	100	3e-	3e	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
063UD:ULYSSES---	100	N/A	6e	Not prime farmland	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
063UE:ULYSSES---	100	N/A	4e	Prime farmland if irrigated	B	Limy Upland (pe16-20)	7	.32	.32	5	6	48
171AN:BRIDGEPORT	100	N/A	5w	Not prime farmland	B	Loamy Lowland (pe16-20)	5	.28	.28	5	4L	86
171MM:CAMPUS----	75	N/A	6e	Not prime farmland	B	Sandy (pe16-20)	5	.28	.32	2	4L	86
171MM:CANLON----	25	N/A	7s	Not prime farmland	D	Shallow Limy (pe16-20)	5	.32	.32	1	4L	86
181RH:ROUGH BROKEN LAND----	65	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.32	.32	5	4L	86
181RH:GRAVELLY LAND----------	35	6e-	6e	Not prime farmland	B	Gravelly Hills (pe16-20)	3	.24	.24	5	3	86
193CD:COLBY-----	100	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.43	.43	5	4L	86
193US:ULYSSES---	100	3e-	3e	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48

Logan County, Kansas: Maintenance needed
Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
199BB:BANKARD---	100	4w-	6w	Not prime farmland	A	Sands (pe16-20)	2	.17	.17	5	2	134
199BC:BANKARD---	100	4w-	4w	Prime farmland if irrigated	A	Sandy (pe16-20)	3	.24	.24	5	3	86
199BO:BRIDGEPORT	100	2w-	2w	Prime farmland if irrigated	B	Loamy Lowland (pe16-20)	5	.32	.32	5	4L	86
199BP:BRIDGEPORT	100	1-	2c	All areas are prime farmland	B	Loamy Terrace (pe20-26)	5	.32	.32	5	4L	86
199CD:CANYON----	100	N/A	6s	Not prime farmland	D	Shallow Limy (pe16-20)	5	.32	.37	2	4L	86
199CP:COLBY-----	100	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.43	.43	5	4L	86
199KO:KIM-------	70	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.32	.32	5	4L	86
199KO:OTERO-----	30	6e-	6e	Not prime farmland	B	Sandy (pe16-20)	3	.24	.24	5	3	86
199KU:KUMA------	100	1-	3c	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
199MC:MANTER----	100	3e-	4e	Not prime farmland	B	Sandy (pe16-20)	3	.20	.20	5	3	86
203MM:CAMPUS----	60	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.28	.32	2	4L	86
203MM:CANLON----	40	N/A	6s	Not prime farmland	D	Shallow Limy (pe16-20)	5	.32	.32	1	4L	86
An:BRIDGEPORT---	100	2w-	2w	Not prime farmland	B	Loamy Lowland (pe16-20)	5	.32	.32	5	4L	86
Bl:BADLAND------	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Bp:BRIDGEPORT---	100	1-	2c	Not prime farmland	B	Loamy Terrace (pe16-20)	5	.32	.32	5	4L	86
Bv:ANGELUS------	100	N/A	4w	Not prime farmland	B	Loamy Lowland (pe16-20)	5	.37	.37	5	4L	86
CAA:CARUSO------	100	2w-	3w	Prime farmland if irrigated	C	Subirrigated (pe16-20)	5	.28	.28	5	4L	86
COD:COLBY-------	100	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.43	.43	5	4L	86
Cc:COLBY--------	100	3e-	4e	Not prime farmland	B	Limy Upland (pe16-20)	5	.43	.43	5	4L	86
Cd:COLBY--------	100	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.43	.43	5	4L	86

Logan County, Kansas: Maintenance needed
Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
Dw:DWYER--------	100	N/A	6e	Not prime farmland	A	Sands (pe16-20)	2	.17	.17	5	2	134
Ea:ELKADER------	100	1-	2c	Not prime farmland	B	Limy Upland (pe16-20)	5	.32	.32	4	4L	86
Eb:ELKADER------	100	2e-	2e	Not prime farmland	B	Limy Upland (pe16-20)	5	.32	.32	4	4L	86
Ec:ELKADER------	100	N/A	3e	Not prime farmland	B	Limy Upland (pe16-20)	5	.32	.32	4	4L	86
Ed:ELKADER------	100	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.32	.32	4	4L	86
Gr:SCHAMBER-----	100	N/A	6s	Not prime farmland	A	Gravelly Hills (pe16-20)	9	.17	.24	5	8	0
Ka:KEITH--------	100	1-	2c	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Kb:KEITH--------	100	2e-	2e	All areas are prime farmland	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Lb:LAS----------	100	2w-	4w	Not prime farmland	C	Loamy Lowland (pe16-20)	5	.32	.32	4	4L	86
Ld:LAS ANIMAS---	100	3w-	3w	Not prime farmland	C	Sandy Lowland (pe16-20)	3	.24	.24	5	3	86
Lk:LIKES--------	100	N/A	6e	Not prime farmland	A	Sands (pe16-20)	2	.17	.17	5	2	134
Ll:LINCOLN------	100	N/A	6w	Not prime farmland	A	Sandy Lowland (pe16-20)	2	.17	.17	5	2	134
Lm:MIDWAY-------	100	4e-	6e	Not prime farmland	D	Shale Breaks (pe16-20)	4	.32	.32	2	4	86
Ln:SIMEON-------	100	N/A	6s	Not prime farmland	A	Shallow Limy (pe16-20)	2	.17	.17	5	2	134
Lo:PLEASANT-----	100	N/A	4w	Not prime farmland	D	Lakebed (pe16-20)	8	.37	.37	5	7	38
Lu:LUBBOCK------	100	1-	2c	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Mh:MANTER-------	100	3e-	3e	Not prime farmland	B	Sandy (pe16-20)	3	.20	.20	5	3	86
Mk:MANTER-------	100	3e-	4e	Not prime farmland	B	Sandy (pe16-20)	3	.20	.20	5	3	86
Mn:MANVEL-------	100	4e-	4e	Not prime farmland	B	Chalk Flats (pe16-20)	5	.37	.37	5	4L	86
Mp:MINNEQUA-----	60	4e-	6e	Not prime farmland	C	Chalk Flats (pe16-20)	5	.37	.37	3	4L	86

Logan County, Kansas: Maintenance needed
Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
Mp:PENROSE------	40	N/A	6s	Not prime farmland	D	Shallow Limy (pe16-20)	5	.32	.32	2	4L	86
Ot:OTERO--------	100	3e-	4e	Not prime farmland	B	Sandy (pe16-20)	3	.24	.24	5	3	86
Po:CANYON-------	100	N/A	6s	Not prime farmland	D	Shallow Limy (pe16-20)	5	.32	.32	2	4L	86
Pr:LIMON--------	100	3s-	6e	Not prime farmland	C	Clay Upland (pe16-20)	4	.24	.24	5	4	86
Ps:LIMON--------	100	4e-	6s	Not prime farmland	C	Clay Upland (pe16-20)	4	.24	.24	5	4	86
Pt:RAZOR--------	100	3e-	6e	Not prime farmland	C	Clay Upland (pe16-20)	4	.37	.37	3	4	86
Ra:NESS---------	100	N/A	6w	Not prime farmland	D	Lakebed (pe16-20)	4	.28	.28	5	4	86
Rc:RICHFIELD----	100	1-	2c	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
SMH:SMOKY HILL RIVER----------	100	N/A	8w	Not prime farmland	D	Unspecified		---	---	-	---	0
UCC:ULYSSES-----	100	3e-	3e	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Ua:ULYSSES------	100	1-	2c	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Ub:ULYSSES------	100	2e-	2e	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Uc:ULYSSES------	100	3e-	3e	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Ud:ULYSSES------	100	N/A	6e	Not prime farmland	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Uh:ULYSSES------	100	2e-	2e	Prime farmland if irrigated	B	Loamy Upland (pe16-20)	8	.32	.32	5	7	38
Ul:ULYSSES------	70	N/A	4e	Not prime farmland	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Ul:COLBY--------	30	3e-	4e	Not prime farmland	B	Limy Upland (pe16-20)	5	.43	.43	5	4L	86
Um:ULYSSES------	60	N/A	6e	Not prime farmland	B	Loamy Upland (pe16-20)	7	.32	.32	5	6	48
Um:COLBY--------	40	N/A	6e	Not prime farmland	B	Limy Upland (pe16-20)	5	.43	.43	5	4L	86

Logan County, Kansas: Maintenance needed
Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro-logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
								K	Kf	T		
Vl:GOSHEN-------	100	1-	2c	Prime farmland if irrigated	B	Loamy Terrace (pe16-20)	7	.32	.32	5	6	48
Vs:GOSHEN-------	70	1-	2c	Not prime farmland	B	Loamy Terrace (pe16-20)	7	.32	.32	5	6	48
Vs:DRUMMOND-----	30	N/A	5s	Not prime farmland	D	Unspecified		.49	.49	2	---	---
W:WATER---------	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Wa:SWEETWATER---	100	N/A	5w	Not prime farmland	D	Saline Subirrigated (pe16-20)	8	.28	.28	4	7	38

RANGELAND PRODUCTIVITY
Logan County, Kansas

Use and Explanation of Rangeland, Grazed Forest Land, Native Pastureland Interpretations

Information in this subsection can be used to plan the use and management of soils for rangeland, grazed forest land, and native pasture. Different kinds of soils vary in their capacity to produce native grasses and other plants suitable for grazing. Information in this subsection provides groupings of similar soils and estimates of potential forage production, which can be used to determine livestock stocking rates.

Rangeland. Range is land on which the native vegetation (climax or natural potential plant community) is predominantly grasses, grasslike plants, forbs, and shrubs suitable for grazing and browsing. Range includes natural grasslands, savannas, many wetlands, some deserts, tundra, and certain shrub and forb communities. Rangeland receives no regular or frequent cultural treatment. The composition and production of the plant community are determined by soil, climate, topography, overstory canopy, and grazing management.

Grazed Forest Land. Includes land on which the understory includes, as an integral part of the forest plant community, plants that can be grazed without significantly impairing other forest values.

Native Pasture. Includes land on which the native vegetation (climax or natural potential plant community) is forest but which is used and managed primarily for production of native plants for forage. Native pasture includes cut-over forest land and forest land cleared and now managed for native or naturalized forage plants.

Rangeland

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management based on the relationship between the soils and vegetation and water.

The Rangeland, Grazed Forest land, Native Pastureland Interpretations shows, for each soil that supports rangeland vegetation, the ecological site and the potential annual production of vegetation in favorable, normal, unfavorable years. An explanation of the column headings in this table follows.

An ecological site is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year’s growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, average, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the National Range and Pasture Handbook, which is available in local offices of the Natural Resources Conservation Service. The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

RANGELAND PRODUCTIVITY--Continued
Logan County, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
063CC:				
Campus	Limy Upland (pe16-20)	3,000	2,000	1,000
Canlon	Shallow Limy (pe16-20)	2,400	1,600	900
063EC:				
Elkader	Limy Upland (pe16-20)	2,500	1,600	1,000
063ED:				
Elkader	Limy Upland (pe16-20)	2,500	1,600	1,000
Manvel	Chalk Flats (pe16-20)	1,800	1,500	1,000
063IN:				
Inavale	Sandy Lowland (pe16-20)	3,500	3,000	2,200
063MB:				
Manvel	Chalk Flats (pe16-20)	1,800	1,500	1,000
Badland	---	---	---	---
063RB:				
Roxbury	Loamy Lowland (pe16-20)	5,000	4,000	2,500
063UD:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
063UE:				
Ulysses	Limy Upland (pe16-20)	2,400	1,800	1,000
171AN:				
Bridgeport	Loamy Lowland (pe16-20)	6,000	4,500	3,500
171MM:				
Campus	Sandy (pe16-20)	2,000	1,600	800
Canlon	Shallow Limy (pe16-20)	900	700	400
181RH:				
Rough Broken Land	Limy Upland (pe16-20)	2,000	1,800	1,400
Gravelly Land	Gravelly Hills (pe16-20)	1,800	1,500	1,000
193CD:				
Colby	Limy Upland (pe16-20)	2,400	1,800	1,000
193US:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
199BB:				
Bankard	Sands (pe16-20)	2,500	1,750	750
199BC:				
Bankard	Sandy (pe16-20)	2,600	1,800	1,000
199BO:				
Bridgeport	Loamy Lowland (pe16-20)	4,000	3,000	2,000
199BP:				
Bridgeport	Loamy Terrace (pe20-26)	4,000	3,000	2,000
199CD:				
Canyon	Shallow Limy (pe16-20)	1,000	900	800
199KO:				
Kim	Limy Upland (pe16-20)	2,400	1,800	1,000
Otero	Sandy (pe16-20)	1,800	1,500	1,000
199KU:				
Kuma	Loamy Upland (pe16-20)	2,000	1,500	800
199MC:				
Manter	Sandy (pe16-20)	2,000	1,600	800
203MM:				
Campus	Limy Upland (pe16-20)	3,000	2,000	1,000
Canlon	Shallow Limy (pe16-20)	2,400	1,600	900
An:				
Bridgeport	Loamy Lowland (pe16-20)	4,000	3,000	2,000
Bl:				
Badland	---	---	---	---
Bp:				
Bridgeport	Loamy Terrace (pe16-20)	4,000	3,000	2,000
Bv:				
Angelus	Loamy Lowland (pe16-20)	4,500	3,500	2,500
CAA:				
Caruso	Subirrigated (pe16-20)	7,500	6,500	5,000
Cc:				
Colby	Limy Upland (pe16-20)	2,400	1,800	1,000
Cd:				
Colby	Limy Upland (pe16-20)	2,400	1,800	1,000
COD:				
Colby	Limy Upland (pe16-20)	1,600	1,200	800
Dw:				
Dwyer	Sands (pe16-20)	2,000	1,700	1,100
Ea:				
Elkader	Limy Upland (pe16-20)	2,500	1,600	1,000
Eb:				
Elkader	Limy Upland (pe16-20)	2,500	1,600	1,000
Ec:				
Elkader	Limy Upland (pe16-20)	2,500	1,600	1,000
Ed:				
Elkader	Limy Upland (pe16-20)	2,500	1,600	1,000
Gr:				
Schamber	Gravelly Hills (pe16-20)	1,400	1,200	700
Ka:				
Keith	Loamy Upland (pe16-20)	3,300	2,900	2,500
Kb:				
Keith	Loamy Upland (pe16-20)	3,300	2,900	2,500
Lb:				
Las	Loamy Lowland (pe16-20)	6,000	5,000	4,000

RANGELAND PRODUCTIVITY--Continued
Logan County, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
Ld:				
Las Animas	Sandy Lowland (pe16-20)	5,000	4,500	3,250
Lk:				
Likes	Sands (pe16-20)	3,000	2,100	1,300
Ll:				
Lincoln	Sandy Lowland (pe16-20)	3,000	2,300	1,800
Lm:				
Midway	Shale Breaks (pe16-20)	1,600	1,400	950
Ln:				
Simeon	Shallow Limy (pe16-20)	1,400	1,200	700
Lo:				
Pleasant	Lakebed (pe16-20)	3,300	2,900	2,500
Lu:				
Lubbock	Loamy Upland (pe16-20)	3,500	2,500	1,500
Mh:				
Manter	Sandy (pe16-20)	2,000	1,600	800
Mk:				
Manter	Sandy (pe16-20)	2,000	1,600	800
Mn:				
Manvel	Chalk Flats (pe16-20)	1,800	1,500	1,000
Mp:				
Minnequa	Chalk Flats (pe16-20)	1,800	1,500	1,000
Penrose	Shallow Limy (pe16-20)	1,000	700	400
Ot:				
Otero	Sandy (pe16-20)	1,800	1,500	1,000
Po:				
Canyon	Shallow Limy (pe16-20)	1,500	1,400	1,200
Pr:				
Limon	Clay Upland (pe16-20)	2,000	1,500	800
Ps:				
Limon	Clay Upland (pe16-20)	2,000	1,500	800
Pt:				
Razor	Clay Upland (pe16-20)	1,500	1,200	900
Ra:				
Ness	Lakebed (pe16-20)	2,000	1,500	500
Rc:				
Richfield	Loamy Upland (pe16-20)	2,400	1,800	800
SMH:				
Smoky Hill River	---	---	---	---
Ua:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
Ub:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
Uc:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
UCC:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
Ud:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
Uh:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
Ul:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
Colby	Limy Upland (pe16-20)	2,400	1,800	1,000
Um:				
Ulysses	Loamy Upland (pe16-20)	2,400	1,800	1,000
Colby	Limy Upland (pe16-20)	2,400	1,800	1,000
Vl:				
Goshen	Loamy Terrace (pe16-20)	3,300	2,900	2,500
Vs:				
Goshen	Loamy Terrace (pe16-20)	3,300	2,900	2,500
Drummond	---	---	---	---
W:				
Water	---	---	---	---
Wa:				
Sweetwater	Saline Subirrigated (pe16-20)	5,000	4,250	3,500

BUILDING SITE DEVELOPMENT
Logan County, Kansas

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The following tables show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
063CC:							
Campus	60	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Slope	0.86
						Depth to hard bedrock	0.46
Canlon	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
063EC:							
Elkader	100	Not limited		Not limited		Somewhat limited	
						Slope	0.12
063ED:							
Elkader	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
Manvel	45	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.00	Slope	0.00	Shrink-swell	0.50
063IN:							
Inavale	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
063MB:							
Manvel	65	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.00	Slope	0.00	Shrink-swell	0.50
Badland	35	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
063RB:							
Roxbury	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
063UD:							
Ulysses	100	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.00	Slope	0.00	Shrink-swell	0.50
063UE:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.00
171AN:							
Bridgeport	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
171MM:							
Campus	75	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.16	Slope	0.16	Depth to hard bedrock	0.64
Canlon	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.99	Slope	1.00	Depth to hard bedrock	0.99
181RH:							
Rough Broken Land	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
Gravelly Land	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
193CD:							
Colby	100	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
193US:							
Ulysses	100	Not limited		Not limited		Somewhat limited	
						Slope	0.12
199BB:							
Bankard	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
199BC:							
Bankard	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
199BO:							
Bridgeport	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
199BP:							
Bridgeport	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
199CD:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
199KO:							
Kim	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
Otero	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
199KU:							
Kuma	100	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
199MC:							
Manter	100	Not limited		Not limited		Somewhat limited	
						Slope	0.00
203MM:							
Campus	60	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.04	Slope	0.04	Depth to hard bedrock	0.46
Canlon	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.96	Slope	0.96	Slope	1.00
An:							
Bridgeport	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Bl:							
Badland	100	Not rated		Not rated		Not rated	
Bp:							
Bridgeport	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Bv:							
Angelus	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
CAA:							
Caruso	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	1.00		
Cc:							
Colby	100	Not limited		Not limited		Somewhat limited	
						Slope	0.00
Cd:							
Colby	100	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
COD:							
Colby	100	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Slope	1.00
Dw:							
Dwyer	100	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
Ea:							
Elkader	100	Not limited		Not limited		Not limited	
Eb:							
Elkader	100	Not limited		Not limited		Not limited	
Ec:							
Elkader	100	Not limited		Not limited		Somewhat limited	
						Slope	0.00
Ed:							
Elkader	100	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
Gr:							
Schamber	100	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Ka:							
Keith	100	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
Kb:							
Keith	100	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lb:							
Las	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
Ld:							
Las Animas	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
Lk:							
Likes	100	Not limited		Not limited		Not limited	
Ll:							
Lincoln	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.03		
Lm:							
Midway	100	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Shrink-swell	1.00	Depth to soft bedrock	1.00
		Shrink-swell	1.00	Depth to soft bedrock	1.00	Shrink-swell	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Ln:							
Simeon	100	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
Lo:							
Pleasant	100	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Lu:							
Lubbock	100	Very limited		Not limited		Very limited	
		Shrink-swell	1.00			Shrink-swell	1.00
Mh:							
Manter	100	Not limited		Not limited		Not limited	
Mk:							
Manter	100	Not limited		Not limited		Somewhat limited	
						Slope	0.00
Mn:							
Manvel	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Mp:							
Minnequa	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.86
				Depth to soft bedrock	0.46	Shrink-swell	0.50
Penrose	40	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Ot:							
Otero	100	Not limited		Not limited		Somewhat limited	
						Slope	0.48
Po:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Pr:							
Limon	100	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Ps:							
Limon	100	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
Pt:							
Razor	100	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.00
Ra:							
Ness	100	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Rc:							
Richfield	100	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	0.50	Shrink-swell	1.00
SMH:							
Smoky Hill River	100	Not rated		Not rated		Not rated	
Ua:							
Ulysses	100	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
Ub:							
Ulysses	100	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
Uc:							
Ulysses	100	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
						Slope	0.00
UCC:							
Ulysses	100	Not limited		Not limited		Somewhat limited	
						Slope	0.12
Ud:							
Ulysses	100	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Slope	0.16	Slope	1.00
		Slope	0.16			Shrink-swell	0.50
Uh:							
Ulysses	100	Not limited		Not limited		Not limited	
Ul:							
Ulysses	70	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
						Slope	0.00
Colby	30	Not limited		Not limited		Somewhat limited	
						Slope	0.00
Um:							
Ulysses	60	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Slope	0.16	Slope	1.00
		Slope	0.16			Shrink-swell	0.50
Colby	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
Vl:							
Goshen	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Vs:							
Goshen	70	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Drummond	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Depth to saturated zone	0.61	Shrink-swell	1.00
W:							
Water	100	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Wa:							
Sweetwater	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.81	Depth to saturated zone	1.00	Depth to saturated zone	0.81

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
063CC:							
Campus	60	Somewhat limited		Very limited		Somewhat limited	
		Low strength	0.78	Depth to hard bedrock	1.00	Depth to bedrock	0.46
		Depth to hard bedrock	0.46	Cutbanks cave	0.10		
Canlon	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10	Droughty	0.58
063EC:							
Elkader	100	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
063ED:							
Elkader	55	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.37	Slope	0.37
		Frost action	0.50	Cutbanks cave	0.10		
		Slope	0.37				
Manvel	45	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	0.10	Slope	0.00
		Shrink-swell	0.50	Slope	0.00		
		Slope	0.00				
063IN:							
Inavale	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	1.00
				Flooding	0.80	Droughty	0.13
063MB:							
Manvel	65	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	0.10	Slope	0.00
		Shrink-swell	0.50	Slope	0.00		
		Slope	0.00				
Badland	35	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10		
063RB:							
Roxbury	100	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
063UD:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Slope	0.00
		Frost action	0.50	Slope	0.00		
		Slope	0.00				
063UE:							
Ulysses	100	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
171AN:							
Bridgeport	100	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.80	Flooding	1.00
		Frost action	0.50	Cutbanks cave	0.10		
171MM:							
Campus	75	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to bedrock	0.65
		Slope	0.16	Slope	0.16	Slope	0.16
				Cutbanks cave	0.10		
Canlon	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.99	Cutbanks cave	1.00	Depth to bedrock	0.99
				Slope	1.00		
181RH:							
Rough Broken Land	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.84	Slope	0.84	Slope	0.84
				Cutbanks cave	0.10		
Gravelly Land	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
193CD:							
Colby	100	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.37	Slope	0.37
		Slope	0.37	Cutbanks cave	0.10		
193US:							
Ulysses	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
199BB:							
Bankard	100	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
				Depth to dense layer	0.50		
				Cutbanks cave	0.10		
199BC:							
Bankard	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Flooding	0.40	Cutbanks cave	0.10	Droughty	0.37
199BO:							
Bridgeport	100	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
199BP:							
Bridgeport	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
		Flooding	0.40				
199CD:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10	Droughty	0.88
199KO:							
Kim	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.84	Slope	0.84	Slope	0.84
				Cutbanks cave	0.10		
Otero	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.84	Slope	0.84	Slope	0.84
				Cutbanks cave	0.10		
199KU:							
Kuma	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
199MC:							
Manter	100	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
203MM:							
Campus	60	Somewhat limited		Very limited		Somewhat limited	
		Frost action	0.50	Depth to hard bedrock	1.00	Depth to bedrock	0.46
		Depth to hard bedrock	0.46	Cutbanks cave	0.10	Slope	0.04
		Slope	0.04	Slope	0.04		
Canlon	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	0.96	Slope	0.96	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	0.96
An:							
Bridgeport	100	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Bl:							
Badland	100	Not rated		Not rated		Not rated	
Bp:							
Bridgeport	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
		Flooding	0.40				

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bv:							
Angelus	100	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
CAA:							
Caruso	100	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Low strength	1.00	Flooding	0.60		
		Frost action	0.50	Cutbanks cave	0.10		
Cc:							
Colby	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
Cd:							
Colby	100	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.16	Slope	0.16
		Slope	0.16	Cutbanks cave	0.10		
COD:							
Colby	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37	Slope	0.37
				Cutbanks cave	0.10		
Dw:							
Dwyer	100	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.84	Cutbanks cave	1.00	Slope	0.84
				Slope	0.84	Droughty	0.26
Ea:							
Elkader	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Eb:							
Elkader	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Ec:							
Elkader	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Ed:							
Elkader	100	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.16	Slope	0.16
		Frost action	0.50	Cutbanks cave	0.10		
		Slope	0.16				
Gr:							
Schamber	100	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
				Slope	1.00	Droughty	1.00
						Gravel content	0.41
Ka:							
Keith	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Kb:							
Keith	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Lb:							
Las	100	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Low strength	1.00	Depth to saturated zone	1.00		
		Shrink-swell	0.50	Flooding	0.60		
		Frost action	0.50				
Ld:							
Las Animas	100	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Frost action	0.50	Depth to saturated zone	1.00	Depth to saturated zone	0.03
		Depth to saturated zone	0.03	Flooding	0.60		
Lk:							
Likes	100	Not limited		Very limited		Very limited	
				Cutbanks cave	1.00	Droughty	0.99

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ll:							
Lincoln	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	1.00
				Flooding	0.80	Droughty	0.92
				Depth to saturated zone	0.03		
Lm:							
Midway	100	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Low strength	1.00	Slope	1.00	Droughty	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10	Too clayey	1.00
		Slope	1.00			Slope	1.00
Ln:							
Simeon	100	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.16	Cutbanks cave	1.00	Slope	0.16
				Slope	0.16	Droughty	0.11
Lo:							
Pleasant	100	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
Lu:							
Lubbock	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
Mh:							
Manter	100	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Mk:							
Manter	100	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Mn:							
Manvel	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
Mp:							
Minnequa	60	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
		Shrink-swell	0.50	Cutbanks cave	0.10		
Penrose	40	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10	Droughty	1.00
						Content of large stones	0.00
Ot:							
Otero	100	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
Po:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
				Cutbanks cave	0.10	Droughty	0.98
Pr:							
Limon	100	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Too clayey	0.28	Too clayey	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10	Salinity	0.13
Ps:							
Limon	100	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Too clayey	0.28	Too clayey	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10	Salinity	0.13
Pt:							
Razor	100	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Too clayey	0.28	Too clayey	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10	Sodium content	1.00

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ra:							
Ness	100	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Low strength	1.00	Cutbanks cave	1.00	Too clayey	1.00
		Shrink-swell	1.00	Too clayey	0.50		
		Frost action	0.50				
Rc:							
Richfield	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
SMH:							
Smoky Hill River	100	Not rated		Not rated		Not rated	
Ua:							
Ulysses	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Ub:							
Ulysses	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Uc:							
Ulysses	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
UCC:							
Ulysses	100	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
Ud:							
Ulysses	100	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.16	Slope	0.16
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Slope	0.16				
Uh:							
Ulysses	100	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Ul:							
Ulysses	70	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Colby	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
Um:							
Ulysses	60	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.16	Slope	0.16
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Slope	0.16				
Colby	40	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.16	Slope	0.16
		Slope	0.16	Cutbanks cave	0.10		
Vl:							
Goshen	100	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.40				
		Low strength	0.22				
Vs:							
Goshen	70	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Cutbanks cave	0.10		
		Flooding	0.40				
		Low strength	0.22				
Drummond	30	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to saturated zone	0.61	Droughty	0.12
		Shrink-swell	1.00	Too clayey	0.28		
		Flooding	0.40	Cutbanks cave	0.10		

BUILDING SITE DEVELOPMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
W:							
Water	100	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
Wa:							
Sweetwater	100	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
		Depth to saturated zone	0.48	Depth to saturated zone	1.00	Depth to saturated zone	0.48
				Flooding	0.60		

CONSTRUCTION MATERIALS
Logan County, Kansas

Construction Materials

The following tables give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated good, fair, or poor as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

The soils are rated as a probable or improbable source of sand and gravel. A rating of probable means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of sand or gravel.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In these tables, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink–swell potential).

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
063CC:					
Campus	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Canlon	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
063EC:					
Elkader	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
063ED:					
Elkader	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Manvel	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
063IN:					
Inavale	100	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.45
		Thickest layer	0.00	Thickest layer	0.45
063MB:					
Manvel	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Badland	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
063RB:					
Roxbury	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
063UD:					
Ulysses	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
063UE:					
Ulysses	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
171AN:					
Bridgeport	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
171MM:					
Campus	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Canlon	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
181RH:					
Rough Broken Land	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gravelly Land	35	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.09
193CD:					
Colby	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
193US:					
Ulysses	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
199BB:					
Bankard	100	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.49
199BC:					
Bankard	100	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.09
199BO:					
Bridgeport	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
199BP:					
Bridgeport	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
199CD:					
Canyon	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
199KO:					
Kim	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Otero	30	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.09
199KU:					
Kuma	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
199MC:					
Manter	100	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.09
		Thickest layer	0.00	Thickest layer	0.09
203MM:					
Campus	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Canlon	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
An:					
Bridgeport	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bl:					
Badland	100	Not rated		Not rated	
Bp:					
Bridgeport	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Bv:					
Angelus	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
CAA:					
Caruso	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cc:					
Colby	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cd:					
Colby	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
COD:					
Colby	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Dw:					
Dwyer	100	Poor		Good	
		Bottom layer	0.00	Thickest layer	0.17
		Thickest layer	0.00		
Ea:					
Elkader	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Eb:					
Elkader	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ec:					
Elkader	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ed:					
Elkader	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Gr:					
Schamber	100	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.08
		Bottom layer	0.00	Bottom layer	0.77
Ka:					
Keith	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Kb:					
Keith	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lb:					
Las	100	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.93
Ld:					
Las Animas	100	Poor		Good	
		Bottom layer	0.00	Thickest layer	0.09
		Thickest layer	0.00		
Lk:					
Likes	100	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.39
		Thickest layer	0.00	Bottom layer	0.56
Ll:					
Lincoln	100	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.22
		Thickest layer	0.00	Thickest layer	0.56

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Lm:					
Midway	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ln:					
Simeon	100	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.33
		Thickest layer	0.00	Bottom layer	0.98
Lo:					
Pleasant	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Lu:					
Lubbock	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mh:					
Manter	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mk:					
Manter	100	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.09
Mn:					
Manvel	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Mp:					
Minnequa	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Penrose	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ot:					
Otero	100	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.08
		Thickest layer	0.00	Thickest layer	0.08
Po:					
Canyon	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pr:					
Limon	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ps:					
Limon	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pt:					
Razor	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ra:					
Ness	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Rc:					
Richfield	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
SMH:					
Smoky Hill River----	100	Not rated		Not rated	
Ua:					
Ulysses----------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ub:					
Ulysses----------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Uc:					
Ulysses----------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
UCC:					
Ulysses----------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ud:					
Ulysses----------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Uh:					
Ulysses----------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Ul:					
Ulysses----------	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colby------------	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Um:					
Ulysses----------	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Colby------------	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Vl:					
Goshen-----------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Vs:					
Goshen-----------	70	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Drummond---------	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
W:					
Water------------	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Wa:					
Sweetwater--------	100	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.46

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
063CC:							
Campus	60	Poor		Poor		Fair	
		Low content of organic matter	0.00	Depth to bedrock	0.00	Depth to bedrock	0.54
		Carbonate content	0.32	Low strength	0.22	Carbonate content	0.97
		Depth to bedrock	0.54				
		Droughty	0.94				
Canlon	40	Poor		Poor		Poor	
		Low content of organic matter	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.18	Slope	0.00
		Droughty	0.00			Rock fragments	0.28
		Carbonate content	0.97			Carbonate content	0.97
063EC:							
Elkader	100	Poor		Good		Poor	
		Low content of organic matter	0.00			Salinity	0.00
		Carbonate content	0.16			Carbonate content	0.16
		Water erosion	0.90				
		Salinity	0.97				
063ED:							
Elkader	55	Fair		Poor		Poor	
		Carbonate content	0.16	Low strength	0.00	Salinity	0.00
		Low content of organic matter	0.50			Carbonate content	0.16
		Water erosion	0.90			Slope	0.63
		Salinity	0.97				
Manvel	45	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
063IN:							
Inavale	100	Poor		Good		Poor	
		Wind erosion	0.00			Too sandy	0.00
		Too sandy	0.00				
		Low content of organic matter	0.12				
		Droughty	0.86				
063MB:							
Manvel	65	Fair		Poor		Good	
		Low content of organic matter	0.50	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
Badland	35	Poor		Poor		Poor	
		Low content of organic matter	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.08	Slope	0.00
063RB:							
Roxbury	100	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
				Shrink-swell	0.98		
063UD:							
Ulysses	100	Poor		Fair		Good	
		Low content of organic matter	0.00	Shrink-swell	0.87		
		Water erosion	0.90				
063UE:							
Ulysses	100	Poor		Fair		Good	
		Low content of organic matter	0.00	Shrink-swell	0.87		
		Water erosion	0.90				
171AN:							
Bridgeport	100	Fair		Good		Good	
		Water erosion	0.90				
		Low content of organic matter	0.92				

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
171MM:							
Campus	75	Fair		Poor		Fair	
		Depth to bedrock	0.35	Depth to bedrock	0.00	Depth to bedrock	0.35
		Carbonate content	0.80			Carbonate content	0.80
		Low content of organic matter	0.82			Slope	0.84
		Droughty	0.86			Rock fragments	0.88
Canlon	25	Fair		Poor		Poor	
		Depth to bedrock	0.01	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.08	Slope	0.08	Depth to bedrock	0.01
		Droughty	0.28			Rock fragments	0.28
181RH:							
Rough Broken Land	65	Poor		Good		Fair	
		Low content of organic matter	0.00			Slope	0.16
						Rock fragments	0.97
Gravelly Land	35	Poor		Fair		Poor	
		Low content of organic matter	0.00	Slope	0.98	Slope	0.00
						Rock fragments	0.97
193CD:							
Colby	100	Poor		Poor		Fair	
		Low content of organic matter	0.00	Low strength	0.00	Slope	0.63
		Water erosion	0.90				
193US:							
Ulysses	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90				
199BB:							
Bankard	100	Poor		Good		Poor	
		Wind erosion	0.00			Hard to reclaim	0.00
		Low content of organic matter	0.50			Rock fragments	0.12
199BC:							
Bankard	100	Poor		Good		Fair	
		Low content of organic matter	0.00			Rock fragments	0.03
		Droughty	0.58			Hard to reclaim	0.98
199BO:							
Bridgeport	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90				
199BP:							
Bridgeport	100	Fair		Poor		Good	
		Low content of organic matter	0.82	Low strength	0.00		
		Water erosion	0.90				
199CD:							
Canyon	100	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.00	Slope	0.82	Slope	0.00
		Depth to bedrock	0.00			Rock fragments	0.03
		Carbonate content	0.32			Carbonate content	0.32
199KO:							
Kim	70	Poor		Good		Fair	
		Low content of organic matter	0.00			Slope	0.16
						Rock fragments	0.97
Otero	30	Poor		Good		Fair	
		Low content of organic matter	0.00			Slope	0.16
						Rock fragments	0.97

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
199KU:							
Kuma	100	Fair		Good		Good	
		Low content of organic matter	0.50				
		No water erosion limitation	0.99				
199MC:							
Manter	100	Poor		Good		Fair	
		Low content of organic matter	0.00			Rock fragments	0.97
203MM:							
Campus	60	Fair		Poor		Fair	
		Depth to bedrock	0.54	Depth to bedrock	0.00	Depth to bedrock	0.54
		Carbonate content	0.80			Carbonate content	0.80
		Droughty	0.94			Slope	0.96
Canlon	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Slope	0.04
		Low content of organic matter	0.82			Rock fragments	0.97
An:							
Bridgeport	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90				
Bl:							
Badland	100	Not rated		Not rated		Not rated	
Bp:							
Bridgeport	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90				
Bv:							
Angelus	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		No water erosion limitation	0.99				
CAA:							
Caruso	100	Poor		Poor		Fair	
		Low content of organic matter	0.00	Low strength	0.00	Depth to saturated zone	0.89
				Depth to saturated zone	0.89		
Cc:							
Colby	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90				
Cd:							
Colby	100	Poor		Poor		Fair	
		Low content of organic matter	0.00	Low strength	0.00	Slope	0.84
		Water erosion	0.90				
COD:							
Colby	100	Poor		Good		Fair	
		Low content of organic matter	0.00			Slope	0.63
		Water erosion	0.90				
Dw:							
Dwyer	100	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.16
		Droughty	0.76			Rock fragments	0.97
		Low content of organic matter	0.88				

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ea:							
Elkader	100	Poor		Poor		Poor	
		Low content of organic matter	0.00	Low strength	0.00	Salinity	0.00
		Carbonate content	0.16			Carbonate content	0.16
		Water erosion	0.90				
		Salinity	0.97				
Eb:							
Elkader	100	Poor		Poor		Poor	
		Low content of organic matter	0.00	Low strength	0.00	Salinity	0.00
		Carbonate content	0.16			Carbonate content	0.16
		Water erosion	0.90				
		Salinity	0.97				
Ec:							
Elkader	100	Poor		Poor		Poor	
		Low content of organic matter	0.00	Low strength	0.00	Salinity	0.00
		Carbonate content	0.16			Carbonate content	0.16
		Water erosion	0.90				
		Salinity	0.97				
Ed:							
Elkader	100	Poor		Poor		Poor	
		Low content of organic matter	0.00	Low strength	0.00	Salinity	0.00
		Carbonate content	0.16			Carbonate content	0.16
		Water erosion	0.90			Slope	0.84
		Salinity	0.97				
Gr:							
Schamber	100	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Low content of organic matter	0.00			Hard to reclaim	0.00
		Droughty	0.00			Rock fragments	0.00
						Slope	0.00
Ka:							
Keith	100	Poor		Good		Good	
		Low content of organic matter	0.00				
		Water erosion	0.90				
Kb:							
Keith	100	Poor		Good		Good	
		Low content of organic matter	0.00				
		Water erosion	0.90				
Lb:							
Las	100	Poor		Fair		Fair	
		Low content of organic matter	0.00	Depth to saturated zone	0.89	Depth to saturated zone	0.89
Ld:							
Las Animas	100	Good		Fair		Fair	
				Depth to saturated zone	0.76	Depth to saturated zone	0.76
Lk:							
Likes	100	Poor		Good		Poor	
		Wind erosion	0.00			Too sandy	0.00
		Low content of organic matter	0.00				
		Too sandy	0.00				
		Droughty	0.00				
Ll:							
Lincoln	100	Poor		Good		Fair	
		Wind erosion	0.00			Too sandy	0.22
		Low content of organic matter	0.00				
		Droughty	0.04				
		Too sandy	0.22				

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lm:							
Midway	100	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.00	Low strength	0.00	Too Clayey	0.00
		Depth to bedrock	0.00	Shrink-swell	0.12	Slope	0.00
		Too clayey	0.00	Slope	0.82	Salinity	0.88
		Water erosion	0.90				
Ln:							
Simeon	100	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.84
		Low content of organic matter	0.50				
		Droughty	0.87				
Lo:							
Pleasant	100	Poor		Poor		Poor	
		Low content of organic matter	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too clayey	0.00	Low strength	0.00	Too Clayey	0.00
		No water erosion limitation	0.99	Shrink-swell	0.64		
Lu:							
Lubbock	100	Poor		Poor		Poor	
		Low content of organic matter	0.00	Low strength	0.00	Too Clayey	0.00
		Too clayey	0.00	Shrink-swell	0.97		
Mh:							
Manter	100	Fair		Good		Fair	
		Low content of organic matter	0.18			Rock fragments	0.97
Mk:							
Manter	100	Poor		Good		Fair	
		Low content of organic matter	0.00			Rock fragments	0.97
Mn:							
Manvel	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
Mp:							
Minnequa	60	Poor		Poor		Fair	
		Low content of organic matter	0.00	Depth to bedrock	0.00	Depth to bedrock	0.54
		Depth to bedrock	0.54	Low strength	0.00	Carbonate content	0.92
		Droughty	0.87	Shrink-swell	0.87		
		Water erosion	0.90				
		Carbonate content	0.92				
Penrose	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.98	Slope	0.00
		Low content of organic matter	0.88			Rock fragments	0.88
Ot:							
Otero	100	Poor		Good		Fair	
		Low content of organic matter	0.00			Rock fragments	0.97
Po:							
Canyon	100	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.00	Slope	0.50	Slope	0.00
		Depth to bedrock	0.00			Rock fragments	0.03
		Carbonate content	0.32			Carbonate content	0.32
Pr:							
Limon	100	Poor		Poor		Poor	
		Low content of organic matter	0.00	Low strength	0.00	Too Clayey	0.00
		Too clayey	0.00	Shrink-swell	0.12	Salinity	0.88

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ps:							
Limon	100	Poor		Poor		Poor	
		Low content of organic matter	0.00	Low strength	0.00	Too Clayey	0.00
		Too clayey	0.00	Shrink-swell	0.12	Salinity	0.88
Pt:							
Razor	100	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Salinity	0.00
		Low content of organic matter	0.50	Depth to bedrock	0.00	Sodium content	0.00
		Salinity	0.50	Shrink-swell	0.12	Too Clayey	0.00
		Sodium content	0.97				
		No water erosion limitation	0.99				
Ra:							
Ness	100	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too Clayey	0.00
				Low strength	0.00	Depth to saturated zone	0.00
				Shrink-swell	0.12		
Rc:							
Richfield	100	Poor		Poor		Fair	
		Low content of organic matter	0.00	Low strength	0.00	Too Clayey	0.02
		Too clayey	0.05	Shrink-swell	0.64		
		Water erosion	0.90				
SMH:							
Smoky Hill River	100	Not rated		Not rated		Not rated	
Ua:							
Ulysses	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90				
Ub:							
Ulysses	100	Fair		Poor		Good	
		Low content of organic matter	0.18	Low strength	0.00		
		Water erosion	0.90				
Uc:							
Ulysses	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90				
UCC:							
Ulysses	100	Fair		Good		Good	
		Low content of organic matter	0.18				
		Water erosion	0.90				
Ud:							
Ulysses	100	Poor		Poor		Fair	
		Low content of organic matter	0.00	Low strength	0.00	Slope	0.84
		Water erosion	0.90				
Uh:							
Ulysses	100	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90				
Ul:							
Ulysses	70	Poor		Poor		Good	
		Low content of organic matter	0.00	Low strength	0.00		
		Water erosion	0.90				

CONSTRUCTION MATERIALS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Colby	30	Poor Low content of organic matter Water erosion	 0.00 0.90	Poor Low strength	 0.00	Good	
Um: Ulysses	60	Poor Low content of organic matter Water erosion	 0.00 0.90	Poor Low strength	 0.00	Fair Slope	 0.84
Colby	40	Poor Low content of organic matter Water erosion	 0.00 0.90	Poor Low strength	 0.00	Fair Slope	 0.84
Vl: Goshen	100	Poor Low content of organic matter Water erosion	 0.00 0.90	Fair Low strength	 0.78	Good	
Vs: Goshen	70	Poor Low content of organic matter Water erosion	 0.00 0.90	Fair Low strength	 0.78	Good	
Drummond	30	Poor Low content of organic matter Too clayey Droughty Water erosion	 0.00 0.00 0.06 0.37	Good		Poor Too Clayey Salinity	 0.00 0.88
W: Water	100	Poor Low content of organic matter	 0.00	Poor Slope Low strength	 0.00 0.00	Poor Slope	 0.00
Wa: Sweetwater	100	Poor Low content of organic matter	 0.00	Fair Depth to saturated zone	 0.29	Fair Depth to saturated zone	 0.29

RECREATIONAL INTERPRETATIONS
Logan County, Kansas

Recreation

The soils of the survey area are rated in the following tables according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in this table can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

RECREATIONAL INTERPRETATIONS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
063CC:							
Campus	60	Not limited		Not limited		Very limited	
						Slope	1.00
						Depth to bedrock	0.46
Canlon	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.06
063EC:							
Elkader	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.87
						Dusty	0.50
063ED:							
Elkader	55	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50
Manvel	45	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.00	Slope	0.00	Dusty	0.50
063IN:							
Inavale	100	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Too sandy	0.87	Flooding	1.00
		Too sandy	0.87	Flooding	0.40	Too sandy	0.87
063MB:							
Manvel	65	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.00	Slope	0.00	Dusty	0.50
Badland	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.45	Restricted permeability	0.45	Restricted permeability	0.45
063RB:							
Roxbury	100	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
063UD:							
Ulysses	100	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.00	Slope	0.00	Dusty	0.50
063UE:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
171AN:							
Bridgeport	100	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
171MM:							
Campus	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
						Depth to bedrock	0.65
Canlon	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.99
						Gravel content	0.06
181RH:							
Rough Broken Land	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Gravel content	0.04
Gravelly Land	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel content	0.05
193CD:							
Colby	100	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50
193US:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.87
						Dusty	0.50
199BB:							
Bankard	100	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too sandy	0.87	Too sandy	0.87
		Too sandy	0.87			Flooding	0.60
199BC:							
Bankard	100	Very limited		Not limited		Not limited	
		Flooding	1.00				
199BO:							
Bridgeport	100	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
199BP:							
Bridgeport	100	Very limited		Not limited		Not limited	

RECREATIONAL INTERPRETATIONS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Flooding	1.00				
199CD:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Gravel content	0.18
199KO:							
Kim	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Gravel content	0.04
Otero	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
						Gravel content	0.05
199KU:							
Kuma	100	Not limited		Not limited		Not limited	
199MC:							
Manter	100	Not limited		Not limited		Somewhat limited	
						Slope	0.50
						Gravel content	0.06
203MM:							
Campus	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
						Depth to bedrock	0.46
Canlon	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.96	Slope	0.96	Slope	1.00
						Gravel content	0.06
An:							
Bridgeport	100	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
Bl:							
Badland	100	Not rated		Not rated		Not rated	
Bp:							
Bridgeport	100	Very limited		Not limited		Not limited	
		Flooding	1.00				
Bv:							
Angelus	100	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
CAA:							
Caruso	100	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
Cc:							
Colby	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
Cd:							
Colby	100	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Dusty	0.50
COD:							
Colby	100	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.37	Slope	0.37	Dusty	0.50
Dw:							
Dwyer	100	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Slope	1.00
		Too sandy	0.34	Too sandy	0.34	Too sandy	0.34
Ea:							
Elkader	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Eb:							
Elkader	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.00
Ec:							
Elkader	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
Ed:							
Elkader	100	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Dusty	0.50
Gr:							
Schamber	100	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	0.41	Gravel content	0.41	Slope	1.00
Ka:							
Keith	100	Somewhat limited		Somewhat limited		Somewhat limited	

RECREATIONAL INTERPRETATIONS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Kb:							
Keith	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.00
Lb:							
Las	100	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
Ld:							
Las Animas	100	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.03	Flooding	0.60
		Depth to saturated zone	0.07			Depth to saturated zone	0.07
Lk:							
Likes	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.79	Too sandy	0.79	Too sandy	0.79
						Slope	0.00
Ll:							
Lincoln	100	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Too sandy	0.91	Flooding	1.00
		Too sandy	0.91	Flooding	0.40	Too sandy	0.91
Lm:							
Midway	100	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
						Gravel content	0.06
Ln:							
Simeon	100	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.72	Too sandy	0.72	Slope	1.00
		Slope	0.16	Slope	0.16	Too sandy	0.72
Lo:							
Pleasant	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Restricted permeability	0.45	Restricted permeability	0.45	Restricted permeability	0.45
Lu:							
Lubbock	100	Not limited		Not limited		Not limited	
Mh:							
Manter	100	Not limited		Not limited		Somewhat limited	
						Gravel content	0.06
						Slope	0.00
Mk:							
Manter	100	Not limited		Not limited		Somewhat limited	
						Slope	0.50
						Gravel content	0.06
Mn:							
Manvel	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.13
Mp:							
Minnequa	60	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
						Dusty	0.50
						Depth to bedrock	0.46
Penrose	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Gravel content	0.16
						Content of large stones	0.00
Ot:							
Otero	100	Not limited		Not limited		Very limited	
						Slope	1.00
						Gravel content	0.05
Po:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Gravel content	0.18
Pr:							
Limon	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50

RECREATIONAL INTERPRETATIONS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
		Salinity	0.13	Salinity	0.13	Salinity	0.13
						Slope	0.13
Ps:							
Limon	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
		Salinity	0.13	Salinity	0.13	Salinity	0.13
						Slope	0.00
Pt:							
Razor	100	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Too clayey	0.50	Too clayey	0.50	Slope	0.50
		Restricted permeability	0.39	Restricted permeability	0.39	Too clayey	0.50
						Restricted permeability	0.39
Ra:							
Ness	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Restricted permeability	0.45	Restricted permeability	0.45	Restricted permeability	0.45
Rc:							
Richfield	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
SMH:							
Smoky Hill River	100	Not rated		Not rated		Not rated	
Ua:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
Ub:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.00
Uc:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
UCC:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.87
						Dusty	0.50
Ud:							
Ulysses	100	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Dusty	0.50
Uh:							
Ulysses	100	Not limited		Not limited		Somewhat limited	
						Slope	0.00
Ul:							
Ulysses	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
Colby	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.50
						Dusty	0.50
Um:							
Ulysses	60	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Dusty	0.50
Colby	40	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Dusty	0.50
Vl:							
Goshen	100	Very limited		Not limited		Not limited	
		Flooding	1.00				
Vs:							
Goshen	70	Very limited		Not limited		Not limited	
		Flooding	1.00				
Drummond	30	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Restricted permeability	0.45	Restricted permeability	0.45

RECREATIONAL INTERPRETATIONS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Restricted permeability	0.45				
W:							
Water	100	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
Wa:							
Sweetwater	100	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.48	Depth to saturated zone	0.81
		Depth to saturated zone	0.81	Restricted permeability	0.15	Flooding	0.60
		Restricted permeability	0.15			Restricted permeability	0.15

RECREATIONAL INTERPRETATIONS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
063CC:					
Campus	60	Not limited		Somewhat limited	
				Depth to bedrock	0.46
Canlon	40	Somewhat limited		Very limited	
		Slope	0.82	Depth to bedrock	1.00
				Slope	1.00
				Droughty	0.58
063EC:					
Elkader	100	Somewhat limited		Not limited	
		Dusty	0.50		
063ED:					
Elkader	55	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.37
Manvel	45	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.00
063IN:					
Inavale	100	Somewhat limited		Very limited	
		Too sandy	0.87	Flooding	1.00
		Flooding	0.40	Droughty	0.13
063MB:					
Manvel	65	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.00
Badland	35	Very limited		Very limited	
		Water erosion	1.00	Depth to bedrock	1.00
		Slope	0.92	Slope	1.00
063RB:					
Roxbury	100	Not limited		Somewhat limited	
				Flooding	0.60
063UD:					
Ulysses	100	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.00
063UE:					
Ulysses	100	Somewhat limited		Not limited	
		Dusty	0.50		
171AN:					
Bridgeport	100	Somewhat limited		Very limited	
		Flooding	0.40	Flooding	1.00
171MM:					
Campus	75	Not limited		Somewhat limited	
				Depth to bedrock	0.65
				Slope	0.16
Canlon	25	Somewhat limited		Very limited	
		Slope	0.92	Slope	1.00
				Depth to bedrock	0.99
181RH:					
Rough Broken Land	65	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.84
Gravelly Land	35	Somewhat limited		Very limited	
		Slope	0.02	Slope	1.00
193CD:					
Colby	100	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.37
193US:					
Ulysses	100	Somewhat limited		Not limited	
		Dusty	0.50		
199BB:					
Bankard	100	Somewhat limited		Somewhat limited	
		Too sandy	0.87	Flooding	0.60
199BC:					
Bankard	100	Not limited		Somewhat limited	
				Droughty	0.37
199BO:					
Bridgeport	100	Not limited		Somewhat limited	
				Flooding	0.60
199BP:					
Bridgeport	100	Not limited		Not limited	
199CD:					
Canyon	100	Somewhat limited		Very limited	
		Dusty	0.50	Depth to bedrock	1.00
		Slope	0.18	Slope	1.00
				Droughty	0.88
199KO:					
Kim	70	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.84
Otero	30	Not limited		Somewhat limited	
				Slope	0.84
199KU:					
Kuma	100	Not limited		Not limited	
199MC:					
Manter	100	Not limited		Not limited	

RECREATIONAL INTERPRETATIONS--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
203MM:					
Campus	60	Not limited		Somewhat limited	
				Depth to bedrock	0.46
				Slope	0.04
Canlon	40	Not limited		Very limited	
				Depth to bedrock	1.00
				Droughty	1.00
				Slope	0.96
An:					
Bridgeport	100	Not limited		Somewhat limited	
				Flooding	0.60
Bl:					
Badland	100	Not rated		Not rated	
Bp:					
Bridgeport	100	Not limited		Not limited	
Bv:					
Angelus	100	Not limited		Somewhat limited	
				Flooding	0.60
CAA:					
Caruso	100	Not limited		Somewhat limited	
				Flooding	0.60
Cc:					
Colby	100	Somewhat limited		Not limited	
		Dusty	0.50		
Cd:					
Colby	100	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.16
COD:					
Colby	100	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.37
Dw:					
Dwyer	100	Somewhat limited		Somewhat limited	
		Too sandy	0.34	Slope	0.84
				Droughty	0.26
Ea:					
Elkader	100	Somewhat limited		Not limited	
		Dusty	0.50		
Eb:					
Elkader	100	Somewhat limited		Not limited	
		Dusty	0.50		
Ec:					
Elkader	100	Somewhat limited		Not limited	
		Dusty	0.50		
Ed:					
Elkader	100	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.16
Gr:					
Schamber	100	Somewhat limited		Very limited	
		Slope	0.00	Slope	1.00
				Droughty	1.00
				Gravel content	0.41
Ka:					
Keith	100	Somewhat limited		Not limited	
		Dusty	0.50		
Kb:					
Keith	100	Somewhat limited		Not limited	
		Dusty	0.50		
Lb:					
Las	100	Not limited		Somewhat limited	
				Flooding	0.60
Ld:					
Las Animas	100	Not limited		Somewhat limited	
				Flooding	0.60
				Depth to saturated zone	0.03
Lk:					
Likes	100	Somewhat limited		Very limited	
		Too sandy	0.79	Droughty	0.99
Ll:					
Lincoln	100	Somewhat limited		Very limited	
		Too sandy	0.91	Flooding	1.00
		Flooding	0.40	Droughty	0.92
Lm:					
Midway	100	Somewhat limited		Very limited	
		Too clayey	0.50	Depth to bedrock	1.00
		Slope	0.18	Droughty	1.00
				Too clayey	1.00
				Slope	1.00

RECREATIONAL INTERPRETATIONS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Ln:					
Simeon	100	Somewhat limited		Somewhat limited	
		Too sandy	0.72	Slope	0.16
				Droughty	0.11
Lo:					
Pleasant	100	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
Lu:					
Lubbock	100	Not limited		Not limited	
Mh:					
Manter	100	Not limited		Not limited	
Mk:					
Manter	100	Not limited		Not limited	
Mn:					
Manvel	100	Somewhat limited		Not limited	
		Dusty	0.50		
Mp:					
Minnequa	60	Somewhat limited		Somewhat limited	
		Dusty	0.50	Depth to bedrock	0.46
Penrose	40	Somewhat limited		Very limited	
		Dusty	0.50	Depth to bedrock	1.00
		Slope	0.02	Slope	1.00
				Droughty	1.00
				Content of large stones	0.00
Ot:					
Otero	100	Not limited		Not limited	
Po:					
Canyon	100	Somewhat limited		Very limited	
		Dusty	0.50	Depth to bedrock	1.00
		Slope	0.50	Slope	1.00
				Droughty	0.98
Pr:					
Limon	100	Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	1.00
				Salinity	0.13
Ps:					
Limon	100	Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	1.00
				Salinity	0.13
Pt:					
Razor	100	Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	1.00
				Sodium content	1.00
Ra:					
Ness	100	Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Too clayey	0.50	Too clayey	1.00
Rc:					
Richfield	100	Somewhat limited		Not limited	
		Dusty	0.50		
SMH:					
Smoky Hill River	100	Not rated		Not rated	
Ua:					
Ulysses	100	Somewhat limited		Not limited	
		Dusty	0.50		
Ub:					
Ulysses	100	Somewhat limited		Not limited	
		Dusty	0.50		
Uc:					
Ulysses	100	Somewhat limited		Not limited	
		Dusty	0.50		
UCC:					
Ulysses	100	Somewhat limited		Not limited	
		Dusty	0.50		
Ud:					
Ulysses	100	Somewhat limited		Somewhat limited	
		Dusty	0.50	Slope	0.16
Uh:					
Ulysses	100	Not limited		Not limited	
Ul:					
Ulysses	70	Somewhat limited		Not limited	

RECREATIONAL INTERPRETATIONS--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Colby	30	Dusty Somewhat limited Dusty	0.50 0.50	Not limited	
Um:					
Ulysses	60	Somewhat limited Dusty	 0.50	Somewhat limited Slope	 0.16
Colby	40	Somewhat limited Dusty	 0.50	Somewhat limited Slope	 0.16
Vl:					
Goshen	100	Not limited		Not limited	
Vs:					
Goshen	70	Not limited		Not limited	
Drummond	30	Not limited		Somewhat limited Droughty	 0.12
W:					
Water	100	Very limited Slope Water erosion	 1.00 1.00	Very limited Slope	 1.00
Wa:					
Sweetwater	100	Somewhat limited Depth to saturated zone	 0.11	Somewhat limited Flooding Depth to saturated zone	 0.60 0.48

WILDLIFE INTERPRETATIONS
Logan County, Kansas

Use and Explanation of Wildlife Interpretations

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the development of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, water, and living space. If any one of these elements is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area. If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, properly managing the existing plant cover, and fostering the natural establishment of desirable plants.

In the Wildlife Interpretations table, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

Suitability Ratings

The potential of the soil is rated good, fair, poor, or very poor.

Good − means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose.

Fair − means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results.

Poor − means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and requires intensive effort.

Very Poor − means that limitations are very severe for the designated element or kind of wildlife habitat. Habitat is difficult to create, improve, or maintain in most places, and management is difficult and requires intensive effort.

Description of Wildlife Habitat Elements

Openland habitat consists of croplands, pastures, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kind of wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, killdeer, cottontail rabbit, red fox, and coyote.

Woodland habitat consists of hardwood or conifers, or a mixture of these and associated grasses, legumes and wild herbaceous plants. Examples of wildlife attracted to this habitat are wild turkey, thrushes, woodpeckers, owl, tree squirrels, raccoon, and deer.

Wetland habitat consists of water−tolerant plants in open, marshy or swampy, shallow water areas. Examples of wildlife attracted to this habitat are ducks, geese, herons, bitterns, rails, kingfishers, shorebirds, muskrat, mink, and beaver.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed−producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit−producing shrubs that are suitable for planting on soils rated good are Russian−olive, autumn−olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are fragrant sumac, chokecherry, American plum, sand plum, and gorden currant.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, saltgrass, cordgrass, rushes, sedges, and cattails.

WILDLIFE INTERPRETATIONS--Continued
Logan County, Kansas

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, red fox and coyote.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, cottontail rabbit, prairie chicken, meadowlark, quail, and pheasant.

WILDLIFE INTERPRETATIONS
Logan County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life	Range-land wild-life
063CC:												
CAMPUS	Poor	Fair	Good	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Fair
CANLON	Very poor	Poor	Poor	---	---	Poor	Very poor	Very poor	Poor	---	Very poor	Poor
063EC:												
ELKADER	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Poor
063ED:												
ELKADER	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
MANVEL	Poor	Fair	Fair	Poor	Very poor	---	Very poor	Very poor	Poor	---	Very poor	Fair
063IN:												
INAVALE	Very poor	Poor	Fair	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
063MB:												
MANVEL	Poor	Fair	Fair	Poor	Very poor	---	Very poor	Very poor	Poor	---	Very poor	Fair
BADLAND	---	---	---	---	---	---	---	---	---	---	---	---
063RB:												
ROXBURY	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor	Fair
063UD:												
ULYSSES	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Fair
063UE:												
ULYSSES	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Fair
171AN:												
BRIDGEPORT	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Poor
171MM:												
CAMPUS	Poor	Fair	Good	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Fair
CANLON	Very poor	Poor	Poor	---	---	Poor	Very poor	Very poor	Poor	---	Very poor	Poor
181RH:												
ROUGH BROKEN LAND	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
GRAVELLY LAND	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
193CD:												
COLBY	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
193US:												
ULYSSES	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Fair
199BB:												
BANKARD	Poor	Poor	Fair	Poor	Fair	Poor	Very poor	Very poor	Poor	Fair	Very poor	Poor
199BC:												
BANKARD	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
199BO:												
BRIDGEPORT	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Poor
199BP:												
BRIDGEPORT	Good	Good	Good	---	---	Fair	Poor	Poor	Good	---	Poor	Fair
199CD:												
CANYON	Poor	Poor	Fair	Poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Poor
199KO:												
KIM	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair

WILDLIFE INTERPRETATIONS--Continued
Logan County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life	Range-land wild-life
OTERO	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
199KU:												
KUMA	Fair	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
199MC:												
MANTER	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
203MM:												
CAMPUS	Poor	Fair	Good	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Fair
CANLON	Poor	Poor	Poor	---	---	Poor	Very poor	Very poor	Poor	---	Very poor	Poor
An:												
BRIDGEPORT	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Poor
Bl:												
BADLAND	---	---	---	---	---	---	---	---	---	---	---	---
Bp:												
BRIDGEPORT	Good	Good	Good	---	---	Fair	Poor	Poor	Good	---	Poor	Fair
Bv:												
ANGELUS	Fair	Fair	Fair	---	---	Fair	Poor	Poor	Fair	---	Poor	Fair
CAA:												
CARUSO	Fair	Fair	Good	Poor	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair
Cc:												
COLBY	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Poor
Cd:												
COLBY	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
COD:												
COLBY	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
Dw:												
DWYER	Poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Ea:												
ELKADER	Good	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Poor
Eb:												
ELKADER	Good	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Poor
Ec:												
ELKADER	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Poor
Ed:												
ELKADER	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
Gr:												
SCHAMBER	Very poor	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Poor
Ka:												
KEITH	Good	Good	Good	Fair	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
Kb:												
KEITH	Good	Good	Good	Fair	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
Lb:												
LAS	Fair	Fair	Fair	---	---	Fair	Fair	Fair	Fair	---	Fair	Fair
Ld:												
LAS ANIMAS	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair	Good
Lk:												
LIKES	Poor	Fair	Good	---	Very poor	Good	Very poor	Very poor	Fair	Very poor	Very poor	Good

WILDLIFE INTERPRETATIONS--Continued
Logan County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life	Range-land wild-life
Ll: LINCOLN	Fair	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Lm: MIDWAY	Very poor	Very poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Ln: SIMEON	Poor	Poor	Fair	Poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Fair
Lo: PLEASANT	Fair	Fair	Fair	Very poor	Very poor	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Lu: LUBBOCK	Good	Good	Fair	---	---	Poor	Poor	Fair	Fair	---	Poor	Fair
Mh: MANTER	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Mk: MANTER	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Mn: MANVEL	Poor	Fair	Fair	Poor	Very poor	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Mp: MINNEQUA	Poor	Fair	Fair	Poor	Very poor	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
PENROSE	Very poor	Very poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Ot: OTERO	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Po: CANYON	Poor	Poor	Fair	Poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor	Poor
Pr: LIMON	Poor	Poor	Fair	---	---	Fair	Poor	Very poor	Poor	---	Very poor	Fair
Ps: LIMON	Poor	Poor	Fair	---	---	Fair	Poor	Very poor	Poor	---	Very poor	Fair
Pt: RAZOR	Fair	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Ra: NESS	Poor	Poor	Poor	---	---	Poor	Fair	Good	Poor	---	Good	Poor
Rc: RICHFIELD	Good	Good	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Fair
SMH: SMOKY HILL RIVER	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor	Poor	Very poor
Ua: ULYSSES	Good	Good	Fair	---	---	Poor	Poor	Fair	Fair	---	Poor	Fair
Ub: ULYSSES	Good	Good	Fair	---	---	Poor	Poor	Fair	Fair	---	Poor	Fair
Uc: ULYSSES	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Fair
UCC: ULYSSES	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Fair
Ud: ULYSSES	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Fair

WILDLIFE INTERPRETATIONS--Continued
Logan County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
Uh:												
ULYSSES	Good	Good	Fair	---	---	Poor	Poor	Fair	Fair	---	Poor	Fair
Ul:												
ULYSSES	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Fair
COLBY	Fair	Good	Fair	---	---	Poor	Poor	Poor	Fair	---	Poor	Poor
Um:												
ULYSSES	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Fair
COLBY	Poor	Fair	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
Vl:												
GOSHEN	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
Vs:												
GOSHEN	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
DRUMMOND	Poor	Fair	Fair	---	Poor	Poor	Fair	Fair	Fair	---	Fair	Poor
W:												
WATER	---	---	---	---	---	---	---	---	---	---	---	---
Wa:												
SWEETWATER	Poor	Fair	Good	---	Very poor	Fair	Good	Good	Fair	---	Good	Fair

YIELDS PER ACRE OF PASTURE AND HAYLAND
Logan County, Kansas

Use and Explanation of Pastureland and Hayland Interpretations

This subsection provides information concerning the suitability of soils for the production of pasture and hayland. This subsection may contain pasture and hayland suitability groupings, land capability and yield estimates, yield estimates for individual grasses or legumes, or other information pertaining to the production of forage.

Pasture and Hayland Suitability Groupings

Soils are placed in pasture and hayland groups according to their suitability for the production of forage. The soils in each group are enough alike to be suited to the same grasses or legumes, to have similar limitations and hazards, to require similar management, and to have similar productivity and other responses to management. Thus, the pasture and hayland suitability group is a convenient way of grouping the soils for their management. If used, these groupings are identified and described in other reports in the subsection.

Yield Estimates

The average yields per acre that can be expected of the principal pasture or hayland crops, under a high level of management, are presented in this subsection. In any given year, yields may be higher or lower than those indicated in the tables because of variations in rainfall or other climatic factors. The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

Under good management, proper grazing is essential for the production of high quality forage, stand survival, and erosion control. Proper grazing helps plants maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation are also important management practices.

The Pasture and Hayland table show yield estimates in tons per acre and animal unit months for pasture and hayland groups. An animal unit month is the amount of forage required by one animal unit (AU) for 30 days. On animal unit (AU) is one (1000 pound) mature cow and a calf up to weaning age (usually six months of age) or their equivalent. The Natural Resources Conservation Service uses 900 pounds of air dry forage as the amount needed to meet this requirement. To maintain a healthy and vigorous plant community, the degree of use should never be greater than 50 percent. Therefore only 25 percent of the total biomass grown is considered consumed by the grazing animal. Animal Unit Months can be converted to air dry pounds per acre production by multiplying the AUM by 30 days, then by 30 pounds per day, and then by four. This figure is the amount of total forage production.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil in the Nontechnical Description section. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

YIELDS PER ACRE OF PASTURE AND HAYLAND--Continued
Logan County, Kansas

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil) Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay		Smooth bromegrass	
	N	I	N	I	N	I
			Tons	Tons	AUM	AUM
063CC:						
Campus	6e	---	---	---	---	---
Canlon	7s	---	---	---	---	---
063EC:						
Elkader	3e	---	---	---	---	---
063ED:						
Elkader	6e	---	---	4.50	---	---
Manvel	6e	4e	---	4.00	---	---
063IN:						
Inavale	4e	3e	1.80	5.00	---	---
063MB:						
Manvel	6e	4e	---	---	---	---
Badland	---	---	---	---	---	---
063RB:						
Roxbury	2w	2w	3.50	6.50	---	6.00
063UC:						
Ulysses	3e	3e	---	4.00	---	---
063UD:						
Ulysses	6e	---	---	---	---	---
063UE:						
Ulysses	4e	---	---	---	---	---
171AN:						
Bridgeport	5w	---	---	---	---	---
171MM:						
Campus	6e	---	---	---	---	---
Canlon	7s	---	---	---	---	---
181RH:						
Rough Broken Land	6e	---	---	---	---	---
Gravelly Land	6e	6e	---	---	---	---
193CD:						
Colby	6e	---	1.00	---	---	---
193US:						
Ulysses	3e	3e	---	4.00	---	---
199BB:						
Bankard	6w	4w	---	3.80	---	---
199BC:						
Bankard	4w	4w	---	---	---	---
199BO:						
Bridgeport	2w	2w	3.50	6.50	---	6.00
199BP:						
Bridgeport	2c	1	3.00	6.00	4.50	11.00
199CD:						
Canyon	6s	---	---	---	---	---
199CP:						
Colby	6e	---	---	---	---	---
199KO:						
Kim	6e	---	---	---	---	---
Otero	6e	6e	---	---	---	---
199KU:						
Kuma	3c	1	---	---	---	---
199MC:						
Manter	4e	3e	---	4.50	---	---

YIELDS PER ACRE OF PASTURE AND HAYLAND--Continued
Logan County, Kansas

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil) Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay		Smooth bromegrass	
	N	I	N	I	N	I
			Tons	Tons	AUM	AUM
203MM:						
Campus	6e	---	---	---	---	---
Canlon	6s	---	---	---	---	---
An:						
Bridgeport	2w	2w	3.50	6.50	---	---
Bl:						
Badland	---	---	---	---	---	---
Bp:						
Bridgeport	2c	1	3.00	6.00	---	---
Bv:						
Angelus	4w	---	---	---	---	---
CAA:						
Caruso	3w	2w	3.00	6.00	---	6.00
Cc:						
Colby	4e	3e	---	3.50	---	---
Cd:						
Colby	6e	---	---	---	---	---
COD:						
Colby	6e	---	---	---	---	---
Dw:						
Dwyer	6e	---	---	---	---	---
Ea:						
Elkader	2c	1	---	---	---	---
Eb:						
Elkader	2e	2e	---	---	---	---
Ec:						
Elkader	3e	---	---	---	---	---
Ed:						
Elkader	6e	---	---	---	---	---
Gr:						
Schamber	6s	---	---	---	---	---
Ka:						
Keith	2c	1	1.70	5.50	---	---
Kb:						
Keith	2e	2e	1.50	5.30	---	---
Lb:						
Las	4w	2w	---	6.00	---	---
Ld:						
Las Animas	3w	3w	---	5.00	---	---
Lk:						
Likes	6e	---	---	---	---	---
Ll:						
Lincoln	6w	---	---	---	---	---
Lm:						
Midway	6e	4e	---	---	---	---
Ln:						
Simeon	6s	---	---	---	---	---
Lo:						
Pleasant	4w	---	---	---	---	---
Lu:						
Lubbock	2c	1	---	---	---	---
Mh:						
Manter	3e	3e	---	5.50	---	---

YIELDS PER ACRE OF PASTURE AND HAYLAND--Continued
Logan County, Kansas

(Yields in the "N" columns are for nonirrigated soils; those in the "I" columns are for irrigated soils. Yields are those that can be expected under a high level of nonirrigated and irrigated management by component. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil) Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Map symbol and soil name	Land capability		Alfalfa hay		Smooth bromegrass	
	N	I	N	I	N	I
			Tons	Tons	AUM	AUM
Mk: Manter	4e	3e	---	---	---	---
Mn: Manvel	4e	4e	---	---	---	---
Mp: Minnequa	6e	4e	---	---	---	---
Penrose	6s	---	---	---	---	---
Ot: Otero	4e	3e	---	---	---	---
Po: Canyon	6s	---	---	---	---	---
Pr: Limon	6e	3s	---	---	---	---
Ps: Limon	6s	4e	---	---	---	---
Pt: Razor	6e	3e	---	---	---	---
Ra: Ness	6w	---	---	---	---	---
Rc: Richfield	2c	1	---	6.00	---	---
SMH: Smoky Hill River	8w	---	---	---	---	---
Ua: Ulysses	2c	1	---	6.00	---	---
Ub: Ulysses	2e	2e	---	5.00	---	---
Uc: Ulysses	3e	3e	---	4.00	---	---
UCC: Ulysses	3e	3e	---	4.00	---	---
Ud: Ulysses	6e	---	---	---	---	---
Uh: Ulysses	2e	2e	---	5.00	---	---
Ul: Ulysses	4e	---	---	---	---	---
Colby	4e	3e	---	---	---	---
Um: Ulysses	6e	---	---	---	---	---
Colby	6e	---	---	---	---	---
Vl: Goshen	2c	1	1.70	5.40	---	---
Vs: Goshen	2c	1	1.70	5.40	---	---
Drummond	5s	---	---	---	---	---
W: Water	---	---	---	---	---	---
Wa: Sweetwater	5w	---	---	---	---	---

CONSERVATION TREE AND SHRUB MANAGEMENT
Logan County, Kansas

A Conservation Tree/Shrub Suitability Group (CTSG), formerly Windbreak Suitability Group, is a physiographic unit or area having similar climatic and edaphic characteristics that control the selection and height growth of trees and shrubs.

In this table, the Conservation Tree and Shrub Grouping is expressed as a group index number. The group index for Conservation Tree and Shrub groups (CTSG) are a guide for species best suited for different kinds of soil and for prediction height, growth, and effectiveness. The groupings can be used when selection woody plants for windbreaks, wildlife plantings riparian buffers, reforestation, other environmental plantings, recreation, landscaping, wetland restoration or enhancement and critical area plantings. CTSG's are developed to assure satisfactory species selection and adaptation to specific conditions of soil, climate and physiography. CTSG's are a guide for selection species best suited for different kinds of soil and prediction height growth and effectiveness.

All soil series mapped in the state have been placed in 10 groups of similar soil characteristics. Groups 1, 2, 3, 4, 6, and 9 are further divided into subgroups. In addition, all groups provide information by Major Land Resource Areas.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters a tree or shrub may be well or poorly suited because of soil characteristics. Each tree or shrub also has definable potentials of height growth depending on the factors just mentioned. Accurate definitions of potential heights are necessary for proper windbreak planning and design.

Windbreaks protect livestock, buildings, roads and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low-growing and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Windbreaks are often planted on land that did not grow trees originally. Knowledge of how trees perform on such land can be gained only by observing and recording their performance where trees have been planted and survived. The problem is compounded by the fact that many favorite windbreak species are not indigenous to the areas in which they are planted.

The Kansas Field Office Technical Guide Notice KS-230, Conservation Tree and Shrub Plantings Suitability Groups shows the adapted species listing for each group index number. Showing the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates are based on measurements and observation of established plantings that have been given adequate care. This information should be used to determine the placement of a windbreak, the area protected and the arrangement of species.

A number of attributes are included in the CTSG species tables for each group number found in this section of the Field Office Technical Guide. These attributes were rated subjectively and assigned a relative value to further assist those unfamiliar with individual species characteristics or desirability for the intended use. Definitions and explanations can be found. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery. See part 537 of the National Forestry Manual for additional information.

In the Tree and Shrub Management table interpretive ratings are given for various aspects of forest and conservation tree and shrub management. Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. Well suited indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. Moderately well suited indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable and fair performance can be expected. Some maintenance is needed. Poorly suited indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. Unsuited indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

The paragraphs that follow indicate the soil properties considered in rating the soils for forest and conservation tree and shrub management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet. Also, in the Kansas Field Office Technical Guide Notice KS-230, Conservation Tree and Shrub Plantings Suitability Groups.

Ratings in the columns suitability for hand planting and suitability for mechanical planting are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column suitability for mechanical site preparation (surface) are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1-foot is considered in the ratings.

Ratings in the column suitability for mechanical site preparation (deep) are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column potential for seedling mortality are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality. See the National Forestry Manual, Subpart B for criteria used in rating management concerns. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

CONSERVATION TREE AND SHRUB MANAGEMENT
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Windbreak Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
063CC:						
Campus	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Lime Soil reaction
Canlon	10	Well suited	Poorly suited Slope	Poorly suited Slope	Unsuited Restrictive layer Slope	Moderate Lime Soil reaction
063EC:						
Elkader	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Lime Soil reaction
063ED:						
Elkader	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Lime Soil reaction
Manvel	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
063IN:						
Inavale	1	Well suited	Well suited	Well suited	Well suited	Low
063MB:						
Manvel	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
Badland		Poorly suited Restrictive layer	Poorly suited Slope	Poorly suited Slope	Poorly suited Slope	High Soil reaction
063RB:						
Roxbury	1K	Well suited	Well suited	Well suited	Well suited	Low
063UD:						
Ulysses	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
063UE:						
Ulysses	3	Well suited	Well suited	Well suited	Well suited	Low
171AN:						
Bridgeport	1K	Well suited	Well suited	Well suited	Well suited	Low
171MM:						
Campus	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Lime Soil reaction
Canlon	10	Well suited	Poorly suited Slope	Poorly suited Slope	Poorly suited Restrictive layer Slope	Moderate Soil reaction
181RH:						
Rough Broken Land	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
Gravelly Land	5	Well suited	Poorly suited Slope	Poorly suited Slope	Poorly suited Slope	Moderate Soil reaction
193CD:						
Colby	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
193US:						
Ulysses	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
199BB:						
Bankard	5	Moderately suited Sandiness	Moderately suited Sandiness	Well suited	Well suited	Moderate Soil reaction
199BC:						
Bankard	5	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
199BO:						
Bridgeport	1K	Well suited	Well suited	Well suited	Well suited	Low
199BP:						
Bridgeport	1K	Well suited	Well suited	Well suited	Well suited	Low
199CD:						
Canyon	10	Well suited	Poorly suited Slope	Poorly suited Slope	Poorly suited Slope	Moderate Lime Soil reaction

CONSERVATION TREE AND SHRUB MANAGEMENT
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Windbreak Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
199KO:						
Kim	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
Otero	5	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
199KU:						
Kuma	3	Well suited	Well suited	Well suited	Well suited	Low
199MC:						
Manter	5	Well suited	Well suited	Well suited	Well suited	Low
203MM:						
Campus	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Lime Soil reaction
Canlon	10	Unsuited Restrictive layer	Unsuited Restrictive layer Slope	Unsuited Restrictive layer	Unsuited Restrictive layer	Moderate Soil reaction
An:						
Bridgeport	1K	Well suited	Well suited	Well suited	Well suited	Low
Bl:						
Badland		Not rated	Not rated	Not rated	Not rated	Not rated
Bp:						
Bridgeport	1K	Well suited	Well suited	Well suited	Well suited	Low
Bv:						
Angelus	1K	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
CAA:						
Caruso	1K	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Cc:						
Colby	8	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Cd:						
Colby	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
COD:						
Colby	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
Dw:						
Dwyer	7	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Ea:						
Elkader	8	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Eb:						
Elkader	8	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Ec:						
Elkader	8	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Ed:						
Elkader	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
Gr:						
Schamber	10	Moderately suited Sandiness	Moderately suited Slope Rock fragments Sandiness	Poorly suited Slope	Poorly suited Slope	Low
Ka:						
Keith	3	Well suited	Well suited	Well suited	Well suited	Low
Kb:						
Keith	3	Well suited	Well suited	Well suited	Well suited	Low
Lb:						
Las	1K	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Ld:						
Las Animas	2K	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Lk:						
Likes	7	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction

CONSERVATION TREE AND SHRUB MANAGEMENT
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Windbreak Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
Ll:						
Lincoln	1K	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Lm:						
Midway	10	Moderately suited Stickiness Restrictive layer Rock fragments	Poorly suited Slope Rock fragments Stickiness	Poorly suited Rock fragments Slope	Poorly suited Slope	Moderate Salinity
Ln:						
Simeon	10	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Lo:						
Pleasant	10	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
Lu:						
Lubbock	3	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Mh:						
Manter	5	Well suited	Well suited	Well suited	Well suited	Low
Mk:						
Manter	5	Well suited	Well suited	Well suited	Well suited	Low
Mn:						
Manvel	8	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Mp:						
Minnequa	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Lime Soil reaction
Penrose	10	Moderately suited Restrictive layer Rock fragments	Poorly suited Rock fragments Slope	Poorly suited Rock fragments Slope	Poorly suited Slope	Moderate Soil reaction
Ot:						
Otero	5	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
Po:						
Canyon	10	Moderately suited Restrictive layer Rock fragments	Poorly suited Slope Rock fragments	Poorly suited Rock fragments Slope	Poorly suited Slope	Moderate Lime Soil reaction
Pr:						
Limon	1	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Moderate Soil reaction Salinity
Ps:						
Limon	1	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Moderate Soil reaction Salinity
Pt:						
Razor	8	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low
Ra:						
Ness	10	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness
Rc:						
Richfield	3	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
SMH:						
Smoky Hill River		Not rated	Not rated	Not rated	Not rated	Not rated
Ua:						
Ulysses	3	Well suited	Well suited	Well suited	Well suited	Low
Ub:						
Ulysses	3	Well suited	Well suited	Well suited	Well suited	Low
Uc:						
Ulysses	3	Well suited	Well suited	Well suited	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Windbreak Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
UCC:						
Ulysses	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Ud:						
Ulysses	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Uh:						
Ulysses	3	Well suited	Well suited	Well suited	Well suited	Low
Ul:						
Ulysses	3	Well suited	Well suited	Well suited	Well suited	Low
Colby	8	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Um:						
Ulysses	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Colby	8	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
Vl:						
Goshen	1	Well suited	Well suited	Well suited	Well suited	Low
Vs:						
Goshen	1	Well suited	Well suited	Well suited	Well suited	Low
Drummond	9W	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Moderate Salinity
W:						
Water		Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	High Horizon table contains no data
Wa:						
Sweetwater	2K	Well suited	Well suited	Well suited	Unsuited Wetness	Moderate Soil reaction

ENGINEERING INDEX PROPERTIES
Logan County, Kansas

Engineering Index Properties table gives the engineering classifications and the range of index properties for the layers of each soil in the survey area. Depth to the upper and lower boundaries of each layer is indicated. Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. Loam, for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, gravelly. Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998). The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle–size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL–ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A–1 through A–7 on the basis of particle–size distribution, liquid limit, and plasticity index. Soils in group A–1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A–7 are fine grained. Highly organic soils are classified in group A–8 on the basis of visual inspection. If laboratory data are available, the A–1, A–2, and A–7 groups are further classified as A–1–a, A–1–b, A–2–4, A–2–5, A–2–6, A–2–7, A–7–5, or A–7–6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in Engineering Index Properties table.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry–weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. The estimates of particle–size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

ENGINEERING INDEX PROPERTIES--Continued
Logan County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
063CC:												
Campus	0-5	Silty clay loam	CL	A-6, A-7	0	0	100	100	85-100	60-90	30-45	11-22
	5-20	Clay loam	CL, ML	A-4, A-6, A-7	0	0	100	100	75-95	50-80	33-45	8-20
	20-30	Loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	90-100	70-100	65-85	40-80	33-45	8-20
	>30	Unweathered bedrock			---	---	---	---	---	---	---	---
Canlon	0-4	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	75-100	65-100	50-90	20-40	4-20
	4-15	Loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	75-100	55-100	50-95	35-85	20-40	4-20
	>15	Unweathered bedrock			---	---	---	---	---	---	---	---
063EC:												
Elkader	0-9	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	65-90	25-45	7-20
	9-20	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
	20-60	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
063ED:												
Elkader	0-9	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	65-90	25-45	7-20
	9-20	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
	20-60	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
Manvel	0-3	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	95-100	70-90	25-35	5-15
	3-60	Silt loam	CL-ML, CL	A-4, A-6	0	0	85-100	85-100	85-100	80-90	20-40	5-20
063IN:												
Inavale	0-7	Loamy sand	SC-SM, SM, SP-SM	A-2, A-3	0	0	100	100	85-95	5-35	15-25	NP-5
	7-18	Loamy sand	SC-SM, SM, SP-SM	A-2, A-3	0	0	100	90-100	65-85	5-30	15-25	NP-5
	18-60	Loamy sand	SC-SM, SM, SP-SM	A-2, A-3	0	0	100	90-100	65-85	5-30	15-25	NP-5
063MB:												
Manvel	0-3	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	95-100	70-90	25-35	5-15
	3-60	Silt loam	CL, CL-ML	A-4, A-6	0	0	85-100	85-100	85-100	80-90	20-40	5-20
Badland	0-1	Silt loam			---	---	---	---	---	---	---	---
063RB:												
Roxbury	0-24	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	30-35	10-15
	24-39	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-100	30-45	10-20
	39-60	Silt loam	CL		0	0	100	100	85-100	65-95	30-45	10-20
063UD:												
Ulysses	0-10	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	10-60	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
063UE:												
Ulysses	0-10	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	10-60	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
171AN:												
Bridgeport	0-12	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	65-90	20-35	4-19
	12-60	Loam	CL	A-4, A-6	0	0	100	100	90-100	65-100	25-40	8-20
171MM:												
Campus	0-7	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	80-100	55-90	20-40	3-20
	7-16	Clay loam	CL, ML	A-4, A-6, A-7	0	0	100	100	75-95	50-80	33-45	8-20
	16-28	Clay loam	CL, ML, SC, SM	A-4, A-6, A-7	0	0	90-100	70-100	65-85	40-80	33-45	8-20
	>28	Unweathered bedrock			---	---	---	---	---	---	---	---
Canlon	0-5	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	75-100	65-100	50-90	20-40	4-20
	5-21	Gravelly loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	75-100	55-100	50-95	35-85	20-40	4-20
	>21	Unweathered bedrock			---	---	---	---	---	---	---	---
181RH:												
Rough Broken Land	0-6	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0-5	80-100	75-100	60-90	55-75	20-30	NP-10
	6-60		CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	80-100	75-100	50-95	35-85	20-40	5-15
Gravelly Land	0-14	Sandy loam	SM	A-2	0	0-1	95-100	75-100	50-80	25-35	20-25	NP-5
	14-60		SM	A-2	0	0-1	90-100	75-100	40-80	25-35	15-25	NP-5
193CD:												
Colby	0-4	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	4-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
193US:												
Ulysses	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	7-17	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
	17-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
199BB:												
Bankard	0-5	Loamy sand	SM	A-2	0	0	95-100	90-100	50-90	15-35	---	NP
	5-60		SM, SP, SP-SM	A-3, A-1, A-2	0	0	90-100	50-100	20-75	0-20	---	NP
199BC:												
Bankard	0-5	Sandy loam	SC-SM, SM	A-2, A-4	0	0	100	90-100	50-70	30-40	10-25	NP-10
	5-60		SM, SP	A-2	0	0-5	65-100	60-85	40-75	5-35	---	NP
199BO:												
Bridgeport	0-16	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	65-90	20-35	4-19
	16-60	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	65-100	25-40	8-20

ENGINEERING INDEX PROPERTIES--Continued
Logan County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
199BP:												
Bridgeport-----	0-13	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	65-90	20-35	4-19
	13-60	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	65-100	25-40	8-20
199CD:												
Canyon---------	0-4	Loam	CL, CL-ML, ML	A-4	0	0-5	90-95	75-95	50-95	50-75	15-30	2-10
	4-14	Gravelly loam	GM, ML, SC, SM	A-4	0	0-5	60-95	50-95	45-95	35-75	15-20	NP-10
	>14	Weathered bedrock			---	---	---	---	---	---	---	---
199KO:												
Kim----------	0-6	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0-5	80-100	75-100	60-90	55-75	20-30	NP-10
	6-60	Clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	80-100	75-100	50-95	35-85	20-40	5-15
Otero----------	0-5	Sandy loam	SM	A-2	0	0-1	95-100	75-100	50-80	25-35	20-25	NP-5
	5-60	Sandy loam	SM	A-2	0	0-1	90-100	75-100	40-80	25-35	15-25	NP-5
199KU:												
Kuma----------	0-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	75-95	25-40	NP-15
	8-25	Silty clay loam	CL	A-4, A-6, A-7	0	0	100	95-100	90-100	85-95	30-45	10-25
	25-60		CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	75-95	20-40	NP-15
199MC:												
Manter---------	0-16	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	45-85	25-55	20-30	NP-10
	16-36	Sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	50-85	30-55	15-25	NP-10
	36-60	Sandy loam	SM	A-1, A-2, A-4	0	0	95-100	75-100	40-85	15-50	---	NP
203MM:												
Campus---------	0-8	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	80-100	55-90	20-40	3-20
	8-30	Loam	CL, ML	A-4, A-6, A-7	0	0	100	100	75-95	50-80	33-45	8-20
	>30	Unweathered bedrock			---	---	---	---	---	---	---	---
Canlon---------	0-4	Loam	CL, CL-ML	A-4, A-6	0	0	90-100	75-100	65-100	50-90	20-40	4-20
	>4	Unweathered bedrock			---	---	---	---	---	---	---	---
An:												
Bridgeport-----	0-12	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	65-90	20-35	4-19
	12-60		CL	A-4, A-6	0	0	100	100	90-100	65-100	25-40	8-20
Bl:												
Badland--------	---	---	---	---	---	---	---	---	---	---	---	---
Bp:												
Bridgeport-----	0-18	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	65-90	20-35	4-19
	18-60	Loam	CL	A-4, A-6	0	0	100	100	90-100	65-100	25-40	8-20
Bv:												
Angelus--------	0-6	Silt loam	ML	A-4	0	0	100	100	90-100	85-100	25-35	3-10
	6-60	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	5-15
CAA:												
Caruso---------	0-16	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	65-90	25-40	5-20
	16-60	Loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	95-100	65-85	25-45	5-20
Cc:												
Colby----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	5-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Cd:												
Colby----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	5-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
COD:												
Colby----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	5-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Dw:												
Dwyer----------	0-5	Loamy fine sand	SM	A-2	0	0	100	100	65-80	20-35	---	NP
	5-60	Fine sand	SM, SP-SM	A-2, A-3	0	0	85-100	75-100	50-80	5-35	---	NP
Ea:												
Elkader--------	0-15	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	65-90	25-45	7-20
	15-23	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
	23-60	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
Eb:												
Elkader--------	0-15	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	65-90	25-45	7-20
	15-23	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
	23-60	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
Ec:												
Elkader--------	0-15	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	65-90	25-45	7-20
	15-23	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
	23-60	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
Ed:												
Elkader--------	0-15	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	65-90	25-45	7-20
	15-23	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20
	23-60	Silt loam	CL, ML	A-4, A-6, A-7-6	0	0	95-100	85-100	80-100	70-95	25-50	7-20

ENGINEERING INDEX PROPERTIES--Continued
Logan County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Gr:												
Schamber	0-6	Gravelly sandy loam	GM, GW-GM, SM, SW-SM	A-1, A-2	---	0-5	55-90	50-75	40-60	10-35	15-25	NP-5
	6-60		GW, GW-GM, SW, SW-SM	A-1	---	0-15	30-80	25-50	5-20	0-10	15-25	NP-5
Ka:												
Keith	0-11	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	85-100	85-100	20-35	2-10
	11-32	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-25
	32-60	Silt loam	CL-ML, ML, CL	A-4, A-6	0	0	100	100	90-100	85-100	20-35	2-12
Kb:												
Keith	0-11	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	85-100	85-100	20-35	2-10
	11-31	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	10-25
	31-60	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-100	20-35	2-12
Lb:												
Las	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	50-85	20-40	5-20
	8-32	Clay loam	CL, CL-ML	A-6, A-7, A-4	0	0	100	95-100	95-100	50-85	22-45	5-25
	32-60	Coarse sand	SM, SP-SM	A-1, A-2, A-3	0	0	100	95-100	30-70	5-35	---	NP
Ld:												
Las Animas	0-29	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	95-100	70-90	40-60	20-25	NP-5
	29-35	Loamy fine sand	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	90-100	55-90	25-55	20-25	NP-5
	35-60	Fine sand	SM, SP-SM	A-2, A-3	0	0	100	95-100	75-100	5-25	---	NP
Lk:												
Likes	0-10	Loamy fine sand	SC-SM, SM, SP-SM	A-2-4	0	0-2	90-100	90-100	75-95	10-30	15-25	NP-6
	10-60	Loamy sand	SC-SM, SM, SP-SM	A-2-4	0	0-2	90-100	90-100	75-95	10-30	15-25	NP-6
Ll:												
Lincoln	0-10	Loamy sand	SM	A-2	0	0	100	98-100	90-100	15-35	---	NP
	10-60	Gravelly coarse sand	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	5-35	---	NP
Lm:												
Midway	0-2	Clay	CH, CL	A-7	0	0	75-100	75-100	70-100	70-95	40-60	20-35
	2-12	Gravelly clay	CL	A-6, A-7	0	0	95-100	95-100	90-100	70-95	35-50	15-25
	12-16	Weathered bedrock			---	---	---	---	---	---	---	---
Ln:												
Simeon	0-12	Loamy sand	SM, SP-SM	A-2, A-3	0	0	95-100	90-100	51-95	5-35	15-20	NP
	12-60		SM, SP, SP-SM	A-1, A-2, A-3	0	0	90-100	80-100	35-95	0-30	---	NP
Lo:												
Pleasant	0-8	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	15-25
	8-43	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	95-100	40-65	20-45
	43-60	Silty clay loam	CL, ML	A-4, A-6	0	0	100	100	95-100	80-100	25-40	NP-15
Lu:												
Lubbock	0-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	65-100	25-40	5-20
	10-28	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-100	40-60	20-35
	28-60	Silty clay loam	CL, ML	A-4, A-6	0	0	100	100	95-100	85-100	30-40	7-17
Mh:												
Manter	0-17	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	45-85	25-55	20-30	NP-10
	17-36	Loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	50-85	30-55	15-25	NP-10
	36-50	Loam	SM	A-1, A-2, A-4	0	0	95-100	75-100	40-85	15-50	---	NP
Mk:												
Manter	0-14	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	45-85	25-55	20-30	NP-10
	14-26	Sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	95-100	75-100	50-85	30-55	15-25	NP-10
	26-60	Sandy loam	SM	A-1, A-2, A-4	0	0	95-100	75-100	40-85	15-50	---	NP
Mn:												
Manvel	0-3	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	95-100	70-90	25-35	5-15
	3-60	Silt loam	CL, CL-ML	A-4, A-6	0	0	85-100	85-100	85-100	80-90	20-40	5-20
Mp:												
Minnequa	0-3	Silt loam	CL-ML, ML	A-4	0	0-1	95-100	95-100	80-100	65-90	20-30	NP-10
	3-30	Silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	95-100	95-100	80-90	25-40	5-20
	30-60	Weathered bedrock			---	---	---	---	---	---	---	---
Penrose	0-6	Loam	CL-ML, ML	A-4	---	0-10	90-100	75-95	60-90	50-70	20-30	NP-10
	6-12	Silt loam	CL-ML, ML	A-4	---	0-10	90-100	75-95	60-90	50-70	20-30	NP-10
	>12	Unweathered bedrock			---	---	---	---	---	---	---	---
Ot:												
Otero	0-16	Fine sandy loam	SM	A-2	0	0-1	95-100	75-100	50-80	25-35	20-25	NP-5
	16-60		SM	A-2	0	0-1	90-100	75-100	40-80	25-35	15-25	NP-5
Po:												
Canyon	0-5	Loam	CL, CL-ML, ML	A-4	0	0-5	90-95	75-95	50-95	50-75	15-30	2-10
	5-12	Gravelly loam	SM, GM, ML, SC	A-4	0	0-5	60-95	50-95	45-95	35-75	15-20	NP-10
	>12	Weathered bedrock			---	---	---	---	---	---	---	---
Pr:												
Limon	0-8	Clay	CH, CL	A-7	0	0	100	95-100	95-100	70-90	40-60	20-40
	8-60	Clay	CH, CL	A-6, A-7	0	0	100	95-100	95-100	75-95	35-60	20-40
Ps:												
Limon	0-8	Clay	CH, CL	A-7	0	0	100	95-100	95-100	70-90	40-60	20-40
	8-60	Clay	CH, CL	A-6, A-7	0	0	100	95-100	95-100	75-95	35-60	20-40

ENGINEERING INDEX PROPERTIES--Continued
Logan County, Kansas

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
Pt:												
Razor----------	0-8	Clay	CH, CL	A-7	0	0-5	95-100	95-100	85-100	80-100	40-60	20-40
	8-20	Clay	CH, CL	A-6, A-7	0	0	100	100	90-100	80-100	35-60	20-45
	20-40	Clay	CH, CL	A-6, A-7	0	0	90-100	90-100	80-100	75-100	35-60	20-45
	>40	Weathered bedrock			---	---	---	---	---	---	---	---
Ra:												
Ness----------	0-60	Clay	CH	A-7-6	0	0	100	100	95-100	90-100	50-70	30-45
Rc:												
Richfield------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-100	20-35	2-15
	5-27	Silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	40-60	20-35
	27-60	Silt loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	100	95-100	75-100	25-45	5-20
SMH:												
Smoky Hill Rive	0-6	Sand	SP, SP-SM, SW, SW-SM	A-1, A-3	---	0-5	80-100	75-100	30-60	0-10	---	NP
	6-60		SM, SP, SP-SM	A-1, A-2, A-3	---	0-5	80-100	75-100	40-70	0-20	---	NP
Ua:												
Ulysses--------	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	7-25	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
	25-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Ub:												
Ulysses--------	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	7-25	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
	25-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Uc:												
Ulysses--------	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	7-25	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
	25-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
UCC:												
Ulysses--------	0-6	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	6-16	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
	16-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Ud:												
Ulysses--------	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	7-25	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
	25-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Uh:												
Ulysses--------	0-6	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-100	33-45	12-20
	6-16	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
	16-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Ul:												
Ulysses--------	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	7-25	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
	25-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Colby----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	5-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Um:												
Ulysses--------	0-7	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	7-25	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	85-100	25-43	11-20
	25-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Colby----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
	5-60	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	85-100	25-40	3-15
Vl:												
Goshen---------	0-16	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	70-95	20-40	3-20
	16-26	Silty clay loam	CL	A-4, A-6	0	0	100	100	90-100	85-95	25-40	8-22
	26-60	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-95	20-35	4-15
Vs:												
Goshen---------	0-16	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	70-95	20-40	3-20
	16-26	Silty clay loam	CL	A-4, A-6	0	0	100	100	90-100	85-95	25-40	8-22
	26-60	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-95	20-35	4-15
Drummond-------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	65-97	22-39	3-15
	5-26		CH, CL	A-6, A-7	0	0	100	100	96-100	80-98	35-60	15-35
	26-60				---	---	---	---	---	---	---	---
W:												
Water----------	---	---	---	---	---	---	---	---	---	---	---	---
Wa:												
Sweetwater-----	0-24	Clay loam	CL, CL-ML, SC	A-4, A-6	0	0	100	95-100	80-95	40-70	25-40	7-20
	24-60		SM	A-2	0	0	95-100	90-100	50-80	15-35	15-22	NP-2

PHYSICAL PROPERTIES OF THE SOILS
Logan County, Kansas

Physical Properties table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink–swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3– or 1/10–bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table,the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink–swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K<–>sat) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K<–>sat). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3– or 1/10–bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink–swell potential of soils. The shrink–swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In Physical Properties table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the Physical Properties table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine–earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to

PHYSICAL PROPERTIES OF THE SOILS--Continued
Logan County, Kansas

wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and forzen soil layers also influence wind erosion.

Explanation of Wind Erodibility Groups

Soil erodibility by wind is directly related to the percentage of dry non-erodible surface soil aggregates larger than 0.84 mm in diameter. From this percentage, the wind erodibility index (I-factor) is determined. The I-factor is an expression of the stability of these soil aggregates against breakdown by tillage and abrasion from wind erosion. Soils are placed in Wind Erodibility Groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 mm as shown in the following table.

WEG	Properties of Soil Surface Layer	Dry Soil Aggregates >0.84mm Percent	Wind Erodibilty Index T/Ac/Yr (I)
1	Very fine sand, fine sand, sand, or coarse sand	1	310 1/
		2	250
		3	220
		5	180
		7	160
2	Loamy very fine sand, loamy fine sand, loamy sand, loamy coarse sand, organic soil materials.	10	134
3	Very fine sandy loam, fine sandy loam, sandy loam, or coarse sandy loam.	25	86
4	Clay, silty clay, non-calcareous clay loam, or silty clay loam with >35 percent clay content.	25	86
4L	Calcareous 2/ loam, silt loam, clay loam, or silty clay loam.	25	86
5	Non-calcareous loam and silt loam with <20 percent clay content, or sandy clay loam, sandy clay, and hemic 3/ organic soil materials.	40	56
6	Non-calcareous loam and silt loam with >20 percent clay content, or non-calcareous clay loam with <35 percent clay content.	45	48
7	Silt, non-calcareous silty clay loam with >35 percent clay content and fibric 3/ organic soil material.	50	38
8	Soils not suitable for cultivation due to coarse fragments or wetness; wind erosion is not a problem.	--	0

1/ The "I" values for WEG 1 vary from 160 for coarse sands to 310 for very fine sands. Use an "I" of 220 as an average figure. For coarser sand that has gravel, use a lower figure. For a soil that has no gravel and very fine sand, use a higher figure. (Modification for coarse fragments is preparation.)

2/ Calcareous is a strongly or violently effervescent reaction to cold dilute (1N) HCL.

3/ See Soil Taxonomy for definition.

PHYSICAL PROPERTIES OF THE SOILS--Continued
Logan County, Kansas: Maintenance needed

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
063CC:														
Campus-------	0-5	20	48	28-35	1.25-1.35	0.60-2.00	0.17-0.22	3.0-5.9	1.0-2.0	.28	.28	2	4L	86
	5-20	35	38	18-35	1.30-1.40	0.60-2.00	0.17-0.19	0.0-2.9	---	.28	.28			
	20-30	38	36	18-35	1.40-1.60	0.60-2.00	0.15-0.19	0.0-2.9	---	.28	.28			
	>30	---	---	---	---	---	---	---	---	---	---			
Canlon-------	0-4	42	38	12-27	1.30-1.45	0.60-2.00	0.15-0.24	0.0-2.9	0.5-2.0	.32	.32	1	4L	86
	4-15	43	40	8-27	1.35-1.50	0.60-2.00	0.15-0.22	0.0-2.9	---	.32	.43			
	>15	---	---	---	---	---	---	---	---	---	---			
063EC:														
Elkader------	0-9	11	68	15-27	1.20-1.35	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	4	4L	86
	9-20	9	64	18-35	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.49			
	20-60	9	64	18-35	1.25-1.40	0.60-2.00	0.15-0.22	0.0-2.9	---	.43	.49			
063ED:														
Elkader------	0-9	11	68	15-27	1.20-1.35	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	4	4L	86
	9-20	9	64	18-35	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	0.0-1.0	.43	.49			
	20-60	9	64	18-35	1.25-1.40	0.60-2.00	0.15-0.22	0.0-2.9	0.0-1.0	.43	.49			
Manvel-------	0-3	11	68	15-27	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37	5	4L	86
	3-60	9	64	18-35	1.35-1.40	0.20-0.60	0.16-0.18	3.0-5.9	---	.43	.43			
063IN:														
Inavale------	0-7	85	9	2-10	1.50-1.60	6.00-20.00	0.10-0.12	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	7-18	84	9	3-10	1.50-1.60	6.00-20.00	0.06-0.11	0.0-2.9	0.0-0.5	.17	.17			
	18-60	84	9	3-10	1.50-1.60	6.00-20.00	0.05-0.11	0.0-2.9	0.0-0.5	.17	.17			
063MB:														
Manvel-------	0-3	11	68	15-27	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37	5	4L	86
	3-60	9	64	18-35	1.35-1.40	0.20-0.60	0.16-0.18	3.0-5.9	0.0-1.0	.43	.43			
Badland------	0-1	---	---	---	---	---	---	---	---	---	---	-	---	---
063RB:														
Roxbury------	0-24	10	68	18-27	1.30-1.45	0.60-2.00	0.22-0.24	0.0-2.9	2.0-4.0	.32	.32	5	4L	86
	24-39	7	66	18-35	1.35-1.50	0.60-2.00	0.17-0.22	3.0-5.9	1.0-3.0	.43	.43			
	39-60	9	64	18-35	1.35-1.50	0.60-2.00	0.17-0.22	3.0-5.9	0.5-0.5	.43	.43			
063UD:														
Ulysses------	0-10	12	70	10-27	1.15-1.25	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	10-60	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
063UE:														
Ulysses------	0-10	12	70	10-27	1.15-1.25	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	10-60	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
171AN:														
Bridgeport---	0-12	37	42	14-27	1.30-1.40	0.60-2.00	0.20-0.22	0.0-2.9	1.0-3.0	.28	.28	5	4L	86
	12-60	33	43	18-30	1.40-1.50	0.60-2.00	0.17-0.22	0.0-2.9	0.5-1.0	.43	.43			
171MM:														
Campus-------	0-7	42	37	15-27	1.25-1.35	0.60-2.00	0.20-0.22	0.0-2.9	1.0-2.0	.28	.32	2	4L	86
	7-16	35	38	18-35	1.30-1.40	0.60-2.00	0.17-0.19	0.0-2.9	0.5-2.0	.28	.32			
	16-28	35	38	18-35	1.40-1.50	0.60-2.00	0.15-0.19	0.0-2.9	0.5-1.0	.28	.32			
	>28	---	---	---	---	---	---	---	---	---	---			
Canlon-------	0-5	42	38	12-27	1.35-1.45	0.60-2.00	0.20-0.22	0.0-2.9	0.5-1.0	.32	.32	1	4L	86
	5-21			8-27	1.40-1.50	0.60-2.00	0.15-0.22	0.0-2.9	0.0-0.5	.32	.43			
	>21			---	---	---	---	---	---	---	---			
181RH:														
Rough Broken Land--------	0-6	42	37	15-27	1.30-1.40	0.60-2.00	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	6-60	37	35	20-35	1.40-1.50	0.60-2.00	0.15-0.17	0.0-2.9	---	.32	.32			
Gravelly Land	0-14	66	19	10-20	1.40-1.45	2.00-6.00	0.11-0.13	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	14-60	65	23	5-18	1.45-1.50	2.00-6.00	0.08-0.12	0.0-2.9	---	.24	.24			
193CD:														
Colby--------	0-4	11	68	15-27	1.20-1.30	0.60-2.00	0.20-0.24	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	4-60	10	68	18-27	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
193US:														
Ulysses------	0-7	12	70	10-27	1.15-1.25	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	7-17	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
	17-60	10	68	18-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	---	.43	.43			
199BB:														
Bankard------	0-5	85	9	2-10	1.80-1.95	6.00-20.00	0.10-0.15	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	5-60	64	31	0-10	1.85-2.00	6.00-20.00	0.07-0.14	0.0-2.9	0.0-1.0	.17	.32			
199BC:														
Bankard------	0-5	68	20	5-20	1.50-1.60	2.00-6.00	0.13-0.15	0.0-2.9	1.0-2.0	.24	.24	5	3	86
	5-60	64	30	2-10	1.55-1.65	6.00-20.00	0.05-0.08	0.0-2.9	---	.20	.37			
199BO:														
Bridgeport---	0-16	37	42	14-27	1.30-1.40	0.60-2.00	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	5	4L	86
	16-60	9	67	18-30	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
199BP:														
Bridgeport---	0-13	11	68	14-27	1.30-1.40	0.60-2.00	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	5	4L	86
	13-60	9	67	18-30	1.35-1.50	0.60-2.00	0.20-0.24	0.0-2.9	0.5-1.0	.43	.43			
199CD:														
Canyon-------	0-4	44	40	12-20	1.20-1.30	0.60-2.00	0.20-0.22	0.0-2.9	0.5-1.0	.32	.37	2	4L	86
	4-14	43	38	12-25	1.30-1.50	0.60-2.00	0.13-0.18	0.0-2.9	---	.24	.64			
	>14	---	---	---	---	---	---	---	---	---	---			
199KO:														
Kim----------	0-6	42	37	15-27	1.30-1.40	0.60-2.00	0.16-0.18	0.0-2.9	0.5-1.0	.32	.32	5	4L	86
	6-60	35	38	20-35	1.40-1.50	0.60-2.00	0.15-0.17	0.0-2.9	---	.32	.32			
Otero--------	0-5	66	19	10-20	1.40-1.45	2.00-6.00	0.11-0.13	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	5-60	65	23	5-18	1.45-1.50	2.00-6.00	0.08-0.12	0.0-2.9	---	.24	.24			

PHYSICAL PROPERTIES OF THE SOILS--Continued
Logan County, Kansas: Maintenance needed

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
199KU:														
Kuma---------	0-8	11	68	15-27	1.20-1.30	0.60-2.00	0.18-0.21	0.0-2.9	2.0-4.0	.32	.32	5	6	48
	8-25	7	66	18-35	1.25-1.35	0.60-2.00	0.18-0.21	3.0-5.9	0.6-3.0	.37	.37			
	25-60	8	72	10-30	1.40-1.50	0.60-2.00	0.16-0.18	0.0-2.9	0.0-1.0	.32	.32			
199MC:														
Manter-------	0-16	65	20	10-20	1.35-1.40	2.00-6.00	0.12-0.16	0.0-2.9	2.0-4.0	.20	.20	5	3	86
	16-36	67	20	9-18	1.40-1.50	2.00-6.00	0.11-0.14	0.0-2.9	---	.24	.24			
	36-60	67	23	5-15	1.45-1.60	2.00-6.00	0.08-0.14	0.0-2.9	---	.17	.17			
203MM:														
Campus-------	0-8	42	37	15-27	1.25-1.35	0.60-2.00	0.20-0.22	0.0-2.9	0.5-2.0	.28	.32	2	4L	86
	8-30	38	36	18-35	1.30-1.40	0.60-2.00	0.15-0.19	0.0-2.9	0.5-2.0	.28	.32			
	>30	---	---	---	---	---	---	---	---	---	---			
Canlon-------	0-4	42	38	12-27	1.35-1.45	0.60-2.00	0.20-0.22	0.0-2.9	0.5-2.0	.32	.32	1	4L	86
	>4	---	---	---	---	---	---	---	---	---	---			
An:														
Bridgeport---	0-12	11	68	14-27	1.30-1.40	0.60-2.00	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	5	4L	86
	12-60	9	67	18-30	1.35-1.50	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
Bl:														
Badland------	---			---	---	---	---	---	---	---	---	-	---	---
Bp:														
Bridgeport---	0-18	37	42	14-27	1.30-1.40	0.60-2.00	0.20-0.24	0.0-2.9	1.0-4.0	.32	.32	5	4L	86
	18-60	33	43	18-30	1.35-1.50	0.60-2.00	0.20-0.24	0.0-2.9	---	.43	.43			
Bv:														
Angelus------	0-6	9	67	20-27	1.30-1.40	0.60-2.00	0.18-0.22	0.0-2.9	0.0-2.0	.37	.37	5	4L	86
	6-60	31	41	20-35	1.30-1.40	0.60-2.00	0.18-0.22	0.0-2.9	---	.37	.37			
CAA:														
Caruso-------	0-16	40	38	18-27	1.30-1.40	0.60-2.00	0.19-0.23	0.0-2.9	1.0-4.0	.28	.28	5	4L	86
	16-60	38	36	18-35	1.35-1.50	0.20-2.00	0.16-0.22	0.0-2.9	---	.32	.32			
Cc:														
Colby--------	0-5	11	68	15-27	1.20-1.30	0.60-2.00	0.20-0.24	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	5-60	10	68	18-27	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
Cd:														
Colby--------	0-5	11	68	15-27	1.20-1.30	0.60-2.00	0.20-0.24	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	5-60	10	68	18-27	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
COD:														
Colby--------	0-5	11	68	15-27	1.20-1.30	0.60-2.00	0.20-0.24	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	5-60	10	68	18-27	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
Dw:														
Dwyer--------	0-5	78	16	3-8	1.35-1.45	6.00-20.00	0.08-0.11	0.0-2.9	1.0-3.0	.17	.17	5	2	134
	5-60	95	1	1-8	1.45-1.55	6.00-20.00	0.04-0.11	0.0-2.9	0.5-1.0	.17	.17			
Ea:														
Elkader------	0-15	11	68	15-27	1.20-1.35	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	4	4L	86
	15-23	9	64	18-35	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.49			
	23-60	9	64	18-35	1.25-1.40	0.60-2.00	0.15-0.22	0.0-2.9	---	.43	.49			
Eb:														
Elkader------	0-15	11	68	15-27	1.20-1.35	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	4	4L	86
	15-23	9	64	18-35	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.49			
	23-60	9	64	18-35	1.25-1.40	0.60-2.00	0.15-0.22	0.0-2.9	---	.43	.49			
Ec:														
Elkader------	0-15	11	68	15-27	1.20-1.35	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	4	4L	86
	15-23	9	64	18-35	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.49			
	23-60	9	64	18-35	1.25-1.40	0.60-2.00	0.15-0.22	0.0-2.9	---	.43	.49			
Ed:														
Elkader------	0-15	11	68	15-27	1.20-1.35	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	4	4L	86
	15-23	9	64	18-35	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.49			
	23-60	9	64	18-35	1.25-1.40	0.60-2.00	0.15-0.22	0.0-2.9	---	.43	.49			
Gr:														
Schamber-----	0-6	64	14	18-25	1.40-1.60	6.00-20.00	0.03-0.06	0.0-2.9	0.5-2.0	.17	.24	5	8	0
	6-60	92	2	2-10	1.40-1.65	6.00-20.00	0.03-0.06	0.0-2.9	---	.10	.20			
Ka:														
Keith--------	0-11	11	68	15-27	1.20-1.30	0.60-2.00	0.20-0.23	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	11-32	7	65	20-35	1.10-1.20	0.60-2.00	0.18-0.22	3.0-5.9	---	.28	.28			
	32-60	14	71	10-20	1.30-1.40	0.60-2.00	0.20-0.22	0.0-2.9	---	.43	.43			
Kb:														
Keith--------	0-11	11	68	15-27	1.20-1.30	0.60-2.00	0.20-0.23	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	11-31	9	64	20-35	1.10-1.20	0.60-2.00	0.18-0.22	3.0-5.9	---	.28	.28			
	31-60	14	71	10-20	1.30-1.40	0.60-2.00	0.20-0.22	0.0-2.9	---	.43	.43			
Lb:														
Las----------	0-8	42	37	15-27	1.30-1.45	0.60-2.00	0.17-0.22	3.0-5.9	0.0-1.0	.32	.32	4	4L	86
	8-32	35	38	18-35	1.30-1.50	0.20-0.60	0.15-0.19	3.0-5.9	---	.32	.32			
	32-60	91	6	1-5	1.40-1.60	20.00-20.00	0.02-0.10	0.0-2.9	---	.10	.20			
Ld:														
Las Animas---	0-29	67	20	8-18	1.40-1.55	2.00-6.00	0.16-0.20	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	29-35	86	2	8-18	1.50-1.70	2.00-6.00	0.12-0.18	0.0-2.9	---	.28	.32			
	35-60	97	1	0-5	1.50-1.60	5.95-20.00	0.06-0.08	0.0-2.9	---	.15	.17			
Lk:														
Likes--------	0-10	84	6	5-15	1.50-1.65	6.00-20.00	0.04-0.08	0.0-2.9	0.5-0.5	.17	.17	5	2	134
	10-60	86	4	5-15	1.50-1.70	6.00-20.00	0.02-0.08	0.0-2.9	---	.15	.20			
Ll:														
Lincoln------	0-10	86	4	5-15	1.35-1.50	6.00-20.00	0.06-0.11	0.0-2.9	0.5-0.5	.17	.17	5	2	134
	10-60			5-15	1.30-1.60	6.00-20.00	0.02-0.08	0.0-2.9	---	.17	.17			

PHYSICAL PROPERTIES OF THE SOILS--Continued
Logan County, Kansas: Maintenance needed

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Lm:														
Midway-------	0-2	22	28	40-60	1.25-1.35	0.06-0.20	0.14-0.18	6.0-8.9	0.5-2.0	.32	.32	2	4	86
	2-12	30	30	35-45	1.20-1.35	0.06-0.20	0.14-0.18	6.0-8.9	---	.43	.43			
	12-16			---	---	---	---	---	---	---	---			
Ln:														
Simeon-------	0-12	82	9	5-12	1.30-1.50	6.00-20.00	0.08-0.14	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	12-60	92	2	2-10	1.50-1.70	6.00-20.00	0.05-0.10	0.0-2.9	0.5-0.5	.15	.17			
Lo:														
Pleasant-----	0-8	19	48	27-40	1.10-1.30	0.20-0.60	0.19-0.21	3.0-5.9	2.0-5.0	.37	.37	5	7	38
	8-43	7	53	35-45	1.10-1.30	0.00-0.06	0.14-0.18	6.0-8.9	---	.28	.28			
	43-60	20	54	20-32	1.10-1.30	0.60-2.00	0.18-0.20	0.0-2.9	---	.43	.43			
Lu:														
Lubbock------	0-10	24	52	20-27	1.45-1.60	0.60-2.00	0.17-0.22	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	10-28	7	53	35-45	1.35-1.45	0.20-0.60	0.11-0.19	6.0-8.9	---	.32	.32			
	28-60	20	53	20-35	1.35-1.50	0.60-2.00	0.15-0.20	0.0-2.9	---	.32	.32			
Mh:														
Manter-------	0-17	65	20	10-20	1.35-1.45	2.00-6.00	0.16-0.18	0.0-2.9	0.5-1.0	.20	.20	5	3	86
	17-36	45	42	9-18	1.40-1.50	2.00-6.00	0.12-0.17	0.0-2.9	0.2-0.5	.24	.24			
	36-50	46	44	5-15	1.50-1.60	2.00-6.00	0.08-0.13	0.0-2.9	0.0-0.5	.20	.20			
Mk:														
Manter-------	0-14	65	20	10-20	1.35-1.40	2.00-6.00	0.12-0.16	0.0-2.9	2.0-4.0	.20	.20	5	3	86
	14-26	67	20	9-18	1.40-1.50	2.00-6.00	0.11-0.14	0.0-2.9	---	.24	.24			
	26-60	67	23	5-15	1.45-1.60	2.00-6.00	0.08-0.14	0.0-2.9	---	.17	.17			
Mn:														
Manvel-------	0-3	11	68	15-27	1.30-1.40	0.60-2.00	0.18-0.20	3.0-5.9	0.5-2.0	.37	.37	5	4L	86
	3-60	9	64	18-35	1.35-1.40	0.20-0.60	0.16-0.18	3.0-5.9	---	.43	.43			
Mp:														
Minnequa-----	0-3	11	68	15-27	1.30-1.40	0.60-2.00	0.18-0.20	0.0-2.9	0.5-2.0	.37	.37	3	4L	86
	3-30	9	64	18-35	1.35-1.40	0.60-2.00	0.16-0.18	3.0-5.9	---	.43	.43			
	30-60			---	---	---	---	---	---	---	---			
Penrose------	0-6	40	38	15-30	1.35-1.45	0.60-2.00	0.15-0.18	0.0-2.9	0.5-1.0	.32	.32	2	4L	86
	6-12	25	53	15-30	1.35-1.45	0.60-2.00	0.15-0.18	0.0-2.9	---	.32	.32			
	>12			---	---	---	---	---	---	---	---			
Ot:														
Otero--------	0-16	65	20	10-20	1.40-1.45	2.00-6.00	0.11-0.13	0.0-2.9	0.5-2.0	.24	.24	5	3	86
	16-60	65	23	5-18	1.45-1.50	2.00-6.00	0.08-0.12	0.0-2.9	---	.24	.24			
Po:														
Canyon-------	0-5	44	40	12-20	1.20-1.30	0.60-2.00	0.20-0.22	0.0-2.9	0.5-1.0	.32	.32	2	4L	86
	5-12	43	38	12-25	1.30-1.50	0.60-2.00	0.13-0.18	0.0-2.9	---	.24	.37			
	>12			---	---	---	---	---	---	---	---			
Pr:														
Limon--------	0-8	22	28	40-60	1.30-1.40	0.20-0.60	0.14-0.17	6.0-8.9	0.5-1.0	.24	.24	5	4	86
	8-60	23	29	35-60	1.35-1.45	0.06-0.20	0.12-0.16	6.0-8.9	---	.32	.32			
Ps:														
Limon--------	0-8	22	28	40-60	1.30-1.40	0.20-0.60	0.14-0.17	6.0-8.9	0.5-1.0	.24	.24	5	4	86
	8-60	23	29	35-60	1.35-1.45	0.06-0.20	0.12-0.16	6.0-8.9	---	.32	.32			
Pt:														
Razor--------	0-8	26	29	40-50	1.35-1.40	0.06-0.20	0.15-0.18	6.0-8.9	0.5-2.0	.37	.37	3	4	86
	8-20	23	29	35-60	1.30-1.40	0.06-0.20	0.15-0.18	6.0-8.9	0.0-1.0	.32	.32			
	20-40	23	29	35-60	1.30-1.40	0.06-0.20	0.15-0.18	6.0-8.9	0.5-0.5	.32	.32			
	>40			---	---	---	---	---	---	---	---			
Ra:														
Ness---------	0-60	22	28	40-60	1.30-1.45	0.00-0.06	0.11-0.14	6.0-8.9	1.0-3.0	.28	.28	5	4	86
Rc:														
Richfield----	0-5	29	54	10-24	1.30-1.40	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	5-27	7	54	35-42	1.35-1.50	0.20-0.60	0.14-0.19	6.0-8.9	---	.43	.43			
	27-60	24	50	18-35	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
SMH:														
Smoky Hill River-------	0-6	98	2	0-1	---	6.00-20.00	0.03-0.04	0.0-2.9	0.0-0.1	---	---	-	---	0
	6-60	91	6	0-5	---	6.00-20.00	0.04-0.06	0.0-2.9	---	---	---			
Ua:														
Ulysses------	0-7	12	70	10-27	1.15-1.25	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	7-25	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
	25-60	10	68	18-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	---	.43	.43			
Ub:														
Ulysses------	0-7	12	70	10-27	1.15-1.25	0.60-2.00	0.20-0.24	0.0-2.9	1.0-2.0	.32	.32	5	6	48
	7-25	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	25-60	10	68	18-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	0.0-0.5	.43	.43			
Uc:														
Ulysses------	0-7	12	70	10-27	1.15-1.25	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	7-25	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
	25-60	10	68	18-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	---	.43	.43			
UCC:														
Ulysses------	0-6	12	70	10-27	1.15-1.25	0.60-2.00	0.22-0.24	0.0-2.9	1.0-2.0	.32	.32	5	6	48
	6-16	7	66	21-32	1.25-1.35	0.60-2.00	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	16-60	10	68	18-27	1.25-1.35	0.60-2.00	0.17-0.22	0.0-2.9	0.0-0.5	.43	.43			
Ud:														
Ulysses------	0-7	12	70	10-27	1.15-1.25	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	7-25	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
	25-60	10	68	18-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	---	.43	.43			

PHYSICAL PROPERTIES OF THE SOILS--Continued
Logan County, Kansas: Maintenance needed

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Uh:														
Ulysses------	0-6	7	62	27-35	1.20-1.30	0.60-2.00	0.15-0.22	3.0-5.9	1.0-3.0	.32	.32	5	7	38
	6-16	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
	16-60	10	68	18-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	---	.43	.43			
Ul:														
Ulysses------	0-7	12	70	10-27	1.15-1.25	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	7-25	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
	25-60	10	68	18-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	---	.43	.43			
Colby--------	0-5	11	68	15-27	1.20-1.30	0.60-2.00	0.20-0.24	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	5-60	10	68	18-27	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
Um:														
Ulysses------	0-7	12	70	10-27	1.15-1.25	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	7-25	9	64	21-32	1.20-1.35	0.60-2.00	0.18-0.22	3.0-5.9	---	.43	.43			
	25-60	10	68	18-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	---	.43	.43			
Colby--------	0-5	11	68	15-27	1.20-1.30	0.60-2.00	0.20-0.24	0.0-2.9	0.5-2.0	.43	.43	5	4L	86
	5-60	10	68	18-27	1.25-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
Vl:														
Goshen-------	0-16	11	68	16-25	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	16-26	7	63	25-35	1.30-1.50	0.60-2.00	0.17-0.22	3.0-5.9	---	.43	.43			
	26-60	11	68	15-27	1.20-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
Vs:														
Goshen-------	0-16	11	68	16-25	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	16-26	7	63	25-35	1.30-1.50	0.60-2.00	0.17-0.22	3.0-5.9	---	.43	.43			
	26-60	11	68	15-27	1.20-1.40	0.60-2.00	0.17-0.22	0.0-2.9	---	.43	.43			
Drummond-----	0-5	24	51	20-30	1.35-1.55	0.60-2.00	0.11-0.18	0.0-2.9	0.5-1.0	.49	.49	2	---	---
	5-26	25	27	35-60	1.40-1.65	0.00-0.06	0.09-0.17	6.0-8.9	---	.55	.55			
	26-60			---	---	---	---	---	---	---	---			
W:														
Water--------	---			---	---	---	---	---	---	---	---	-	---	---
Wa:														
Sweetwater---	0-24	35	38	18-35	1.35-1.55	0.20-0.60	0.16-0.20	0.0-2.9	1.0-4.0	.28	.28	4	7	38
	24-60	84	6	3-15	1.50-1.70	6.00-20.00	0.04-0.10	0.0-2.9	---	.17	.20			

CHEMICAL PROPERTIES OF THE SOILS
Logan County, Kansas

The Chemical Properties table shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils. Depth to the upper and lower boundaries of each layer is indicated.

Cation−exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation−exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation−exchange capacity. Soils having a high cation−exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Effective cation−exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium−N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water and can be dissolved and removed by water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one−half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

CHEMICAL PROPERTIES OF THE SOILS--Continued
Logan County, Kansas

Map symbol and soil name	Depth	Cation-exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
063CC:								
Campus----------	0-5	11-22	---	7.4-8.4	0-10	---	---	---
	5-20	7.0-21	---	7.4-8.4	10-25	---	---	---
	20-30	7.0-21	---	7.9-8.4	15-45	---	---	---
	>30	---	0.0-0.0	---	---	---	---	---
Canlon----------	0-4	5.0-18	---	7.4-8.4	5-10	0	0	0
	4-15	3.0-16	---	7.4-8.4	10-25	0	0	0
	>15	---	0.0-0.0	---	---	---	---	---
063EC:								
Elkader----------	0-9	6.0-18	---	7.4-8.4	5-15	---	---	---
	9-20	7.0-21	---	7.9-8.4	10-25	---	---	---
	20-60	7.0-21	---	7.9-9.0	15-50	---	2.0-16.0	---
063ED:								
Elkader----------	0-9	6.0-18	---	7.4-8.4	5-15	---	---	---
	9-20	7.0-21	---	7.9-8.4	10-25	---	---	---
	20-60	7.0-21	---	7.9-9.0	15-50	---	2.0-16.0	---
Manvel----------	0-3	6.0-18	---	7.9-8.4	0-10	0	0.0-2.0	0
	3-60	7.0-21	---	7.9-8.4	10-20	---	2.0-4.0	---
063IN:								
Inavale----------	0-7	1.0-7.0	---	5.6-7.8	0	0	0	0
	7-18	1.0-6.0	---	5.6-7.8	0	0	0	0
	18-60	1.0-6.0	---	6.6-8.4	0-5	0	0	0
063MB:								
Manvel----------	0-3	6.0-18	---	7.9-8.4	0-10	0	0.0-2.0	0
	3-60	7.0-21	---	7.9-8.4	10-20	---	2.0-4.0	---
Badland----------	0-1	---	---	---	---	---	---	---
063RB:								
Roxbury----------	0-24	8.0-19	---	6.6-8.4	1-5	---	---	---
	24-39	7.0-23	---	7.4-8.4	1-5	---	---	---
	39-60	7.0-21	---	7.4-8.4	5-10	---	---	---
063UD:								
Ulysses----------	0-10	4.0-18	---	6.6-7.8	---	---	---	---
	10-60	8.0-19	---	7.4-8.4	0-15	---	---	---
063UE:								
Ulysses----------	0-10	4.0-18	---	6.6-7.8	---	---	---	---
	10-60	8.0-19	---	7.4-8.4	0-15	---	---	---
171AN:								
Bridgeport------	0-12	6.0-18	---	6.6-8.4	1-5	0	0	0
	12-60	7.0-18	---	7.4-8.4	5-10	0	0	0
171MM:								
Campus----------	0-7	6.0-17	---	7.4-8.4	5-10	---	---	---
	7-16	7.0-21	---	7.4-8.4	15-30	---	---	---
	16-28	7.0-21	---	7.9-8.4	15-30	---	---	---
	>28	---	0.0-0.0	---	---	---	---	---
Canlon----------	0-5	4.0-16	---	7.4-8.4	5-10	0	0	0
	5-21	3.0-16	---	7.4-8.4	10-15	0	0	0
	>21	---	0.0-0.0	---	---	---	---	---
181RH:								
Rough Broken Land----------	0-6	6.0-17	---	7.4-8.4	0-5	---	0	---
	6-60	8.0-21	---	7.9-8.4	5-15	---	0.0-4.0	---
Gravelly Land---	0-14	4.0-13	---	7.4-8.4	0-15	0	0.0-2.0	0
	14-60	2.0-11	---	7.4-8.4	0-15	0	0.0-4.0	0
193CD:								
Colby----------	0-4	6.0-18	---	7.4-8.4	0-5	---	---	---
	4-60	7.0-16	---	7.4-8.4	5-15	---	---	---
193US:								
Ulysses----------	0-7	4.0-18	---	6.6-7.8	---	---	---	---
	7-17	8.0-19	---	7.4-8.4	0-15	---	---	---
	17-60	7.0-16	---	7.9-8.4	0-15	---	---	---
199BB:								
Bankard----------	0-5	1.0-7.0	---	7.4-8.4	0-5	---	---	---
	5-60	0.0-7.0	---	7.4-9.0	0-5	0	---	---
199BC:								
Bankard----------	0-5	2.0-13	---	7.4-8.4	0-5	0	0	0
	5-60	0.0-6.0	---	7.4-8.4	0-5	0	0	0
199BO:								
Bridgeport------	0-16	6.0-19	---	6.6-8.4	0-5	0	0	0
	16-60	7.0-18	---	7.4-8.4	5-10	0	0	0
199BP:								
Bridgeport------	0-13	6.0-19	---	6.6-8.4	0-5	0	0	0
	13-60	7.0-18	---	7.4-8.4	5-10	0	0	0
199CD:								
Canyon----------	0-4	5.0-13	---	7.4-8.4	5-15	0	0.0-2.0	0
	4-14	4.0-15	---	7.4-8.4	20-40	0	0.0-2.0	0
	>14	---	0.0-0.0	---	---	---	---	---
199KO:								
Kim----------	0-6	6.0-17	---	7.4-8.4	0-5	---	0	---
	6-60	8.0-21	---	7.9-8.4	5-15	---	0.0-4.0	---
Otero----------	0-5	4.0-13	---	7.4-8.4	0-15	0	0.0-2.0	0
	5-60	2.0-11	---	7.4-8.4	0-15	0	0.0-4.0	0

CHEMICAL PROPERTIES OF THE SOILS--Continued
Logan County, Kansas

Map symbol and soil name	Depth	Cation-exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
199KU:								
Kuma----------	0-8	6.0-19	---	6.1-8.4	---	---	---	---
	8-25	7.0-23	---	6.6-8.4	0-5	---	---	---
	25-60	4.0-19	---	7.9-9.0	0-15	---	0.0-2.0	---
199MC:								
Manter----------	0-16	4.0-15	---	6.6-7.8	0	0	0	0
	16-36	3.0-11	---	6.6-7.8	0	0	0	0
	36-60	2.0-9.0	---	7.9-8.4	0-5	0	0.0-2.0	0
203MM:								
Campus----------	0-8	6.0-17	---	7.4-8.4	10-15	---	---	---
	8-30	7.0-21	---	7.4-8.4	15-30	---	---	---
	>30	---	0.0-0.0	---	---	---	---	---
Canlon----------	0-4	4.0-16	---	7.4-8.4	5-15	0	0	0
	>4	---	0.0-0.0	---	---	---	---	---
An:								
Bridgeport------	0-12	6.0-19	---	6.6-8.4	0-5	0	0	0
	12-60	7.0-18	---	7.4-8.4	5-10	0	0	0
Bl:								
Badland---------	---	---	---	---	---	---	---	---
Bp:								
Bridgeport------	0-18	6.0-19	---	6.6-8.4	0-5	0	0	0
	18-60	7.0-18	---	7.4-8.4	5-10	0	0	0
Bv:								
Angelus---------	0-6	8.0-18	---	7.9-8.4	5-15	---	---	---
	6-60	8.0-21	---	7.9-8.4	5-15	---	---	---
CAA:								
Caruso----------	0-16	7.0-19	---	7.4-8.4	0-5	0	0.0-4.0	0
	16-60	7.0-21	---	7.4-8.4	0-5	0	0.0-4.0	0
Cc:								
Colby----------	0-5	6.0-18	---	7.4-8.4	0-5	---	---	---
	5-60	7.0-16	---	7.4-8.4	5-15	---	---	---
Cd:								
Colby----------	0-5	6.0-18	---	7.4-8.4	0-5	---	---	---
	5-60	7.0-16	---	7.4-8.4	5-15	---	---	---
COD:								
Colby----------	0-5	6.0-18	---	7.4-8.4	0-5	---	---	---
	5-60	7.0-16	---	7.4-8.4	5-15	---	---	---
Dw:								
Dwyer----------	0-5	1.0-7.0	---	6.1-9.0	0-5	---	---	---
	5-60	0.0-5.0	---	7.9-9.0	0-10	---	0.0-2.0	---
Ea:								
Elkader---------	0-15	6.0-18	---	7.4-8.4	5-15	---	---	---
	15-23	7.0-21	---	7.9-8.4	10-25	---	---	---
	23-60	7.0-21	---	7.9-9.0	15-50	---	2.0-16.0	---
Eb:								
Elkader---------	0-15	6.0-18	---	7.4-8.4	5-15	---	---	---
	15-23	7.0-21	---	7.9-8.4	10-25	---	---	---
	23-60	7.0-21	---	7.9-9.0	15-50	---	2.0-16.0	---
Ec:								
Elkader---------	0-15	6.0-18	---	7.4-8.4	5-15	---	---	---
	15-23	7.0-21	---	7.9-8.4	10-25	---	---	---
	23-60	7.0-21	---	7.9-9.0	15-50	---	2.0-16.0	---
Ed:								
Elkader---------	0-15	6.0-18	---	7.4-8.4	5-15	---	---	---
	15-23	7.0-21	---	7.9-8.4	10-25	---	---	---
	23-60	7.0-21	---	7.9-9.0	15-50	---	2.0-16.0	---
Gr:								
Schamber--------	0-6	7.0-16	---	6.1-8.4	---	---	0.0-2.0	---
	6-60	0.0-6.0	---	7.4-8.4	0-10	---	0.0-2.0	---
Ka:								
Keith-----------	0-11	6.0-18	---	6.1-7.8	0	0	0	0
	11-32	0.0-21	---	6.6-8.4	0-5	0	0	0
	32-60	4.0-12	---	7.4-8.4	0-15	0	0	0
Kb:								
Keith-----------	0-11	6.0-18	---	6.1-7.8	0	0	0	0
	11-31	0.0-21	---	6.6-8.4	0-5	0	0	0
	31-60	4.0-12	---	7.4-8.4	0-15	0	0	0
Lb:								
Las---------	0-8	6.0-17	---	7.4-8.4	0-5	0	0.0-4.0	0
	8-32	7.0-21	---	7.4-8.4	0-10	0	0.0-4.0	0
	32-60	0.0-3.0	---	7.4-8.4	0-5	0	0.0-4.0	0
Ld:								
Las Animas------	0-29	3.0-12	---	7.4-8.4	0-5	---	0.0-4.0	---
	29-35	3.0-11	---	7.4-8.4	0-5	---	0.0-2.0	---
	35-60	0.0-3.0	---	7.4-8.4	0-5	---	---	---
Lk:								
Likes-----------	0-10	2.0-9.0	---	7.4-8.4	0-5	0	---	0
	10-60	2.0-9.0	---	7.9-8.4	0-5	0	---	0
Ll:								
Lincoln---------	0-10	2.0-9.0	---	7.4-8.4	0-5	---	---	---
	10-60	2.0-9.0	---	7.9-8.4	0-5	---	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued
Logan County, Kansas

Map symbol and soil name	Depth	Cation-exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
Lm:								
Midway----------	0-2	16-37	---	6.6-8.4	0-5	---	2.0-4.0	---
	2-12	14-27	---	7.9-9.0	0-5	---	2.0-8.0	---
	12-16	---	0.0-0.0	---	---	---	---	---
Ln:								
Simeon----------	0-12	2.0-8.0	---	6.1-7.8	0	0	0	0
	12-60	1.0-6.0	---	6.1-7.8	0	0	0	0
Lo:								
Pleasant--------	0-8	11-27	---	6.6-7.3	---	---	0	---
	8-43	14-27	---	6.6-7.8	---	---	0	---
	43-60	8.0-19	---	7.4-8.4	0-2	---	0.0-2.0	---
Lu:								
Lubbock----------	0-10	8.0-18	---	6.6-7.8	---	---	---	---
	10-28	14-27	---	6.6-8.4	---	---	---	---
	28-60	8.0-21	---	7.9-8.4	0-5	---	---	---
Mh:								
Manter----------	0-17	4.0-13	---	6.6-7.8	0	0	0	0
	17-36	3.0-11	---	6.6-7.8	1-5	0	0	0
	36-50	2.0-9.0	---	7.9-8.4	1-5	0	0.0-2.0	0
Mk:								
Manter----------	0-14	4.0-15	---	6.6-7.8	0	0	0	0
	14-26	3.0-11	---	6.6-7.8	0	0	0	0
	26-60	2.0-9.0	---	7.9-8.4	0-5	0	0.0-2.0	0
Mn:								
Manvel----------	0-3	6.0-18	---	7.9-8.4	0-10	0	0.0-2.0	0
	3-60	7.0-21	---	7.9-8.4	10-20	---	2.0-4.0	---
Mp:								
Minnequa--------	0-3	6.0-18	---	7.4-8.4	5-15	---	0.0-2.0	0
	3-30	7.0-21	---	7.4-9.0	15-25	---	0.0-4.0	---
	30-60	---	0.0-0.0	---	---	---	---	---
Penrose---------	0-6	6.0-19	---	7.9-8.4	0-15	---	0	---
	6-12	6.0-18	---	7.9-8.4	0-15	---	0.0-2.0	---
	>12	---	0.0-0.0	---	---	---	---	---
Ot:								
Otero-----------	0-16	4.0-13	---	7.4-8.4	0-15	0	0.0-2.0	0
	16-60	2.0-11	---	7.4-8.4	0-15	0	0.0-4.0	0
Po:								
Canyon----------	0-5	5.0-13	---	7.4-8.4	5-15	0	0.0-2.0	0
	5-12	4.0-15	---	7.4-8.4	20-40	0	0.0-2.0	0
	>12	---	0.0-0.0	---	---	---	---	---
Pr:								
Limon-----------	0-8	16-37	---	7.4-8.4	0-5	0	2.0-8.0	0
	8-60	14-36	---	7.9-9.0	5-15	---	2.0-8.0	---
Ps:								
Limon-----------	0-8	16-37	---	7.4-8.4	0-5	0	2.0-8.0	0
	8-60	14-36	---	7.9-9.0	5-15	---	2.0-8.0	---
Pt:								
Razor-----------	0-8	16-31	---	6.6-8.4	0-5	---	0.0-2.0	0-10
	8-20	14-37	---	7.4-8.4	0-10	---	0.0-2.0	0-10
	20-40	14-36	---	7.4-8.4	1-15	0-5	8.0-16.0	10-15
	>40	---	0.0-0.0	---	---	---	---	---
Ra:								
Ness----------	0-60	16-38	---	6.1-8.4	0-2	---	---	---
Rc:								
Richfield-------	0-5	4.0-16	---	6.6-7.8	0-5	0	0	0
	5-27	14-25	---	6.6-8.4	0-20	0	0	0
	27-60	7.0-21	---	7.9-9.0	0-15	0	0	0
SMH:								
Smoky Hill River	0-6	0.0-1.0	---	6.6-7.8	---	---	---	---
	6-60	0.0-3.0	---	6.6-7.8	---	---	---	---
Ua:								
Ulysses---------	0-7	4.0-18	---	6.6-7.8	---	---	---	---
	7-25	8.0-19	---	7.4-8.4	0-15	---	---	---
	25-60	7.0-16	---	7.9-8.4	0-15	---	---	---
Ub:								
Ulysses---------	0-7	4.0-18	---	6.6-7.8	---	---	---	---
	7-25	8.0-19	---	7.4-8.4	0-15	---	---	---
	25-60	7.0-16	---	7.9-8.4	0-15	---	---	---
Uc:								
Ulysses---------	0-7	4.0-18	---	6.6-7.8	---	---	---	---
	7-25	8.0-19	---	7.4-8.4	0-15	---	---	---
	25-60	7.0-16	---	7.9-8.4	0-15	---	---	---
UCC:								
Ulysses---------	0-6	4.0-18	---	6.6-7.8	---	---	---	---
	6-16	8.0-19	---	7.4-8.4	5-10	---	---	---
	16-60	7.0-16	---	7.9-8.4	10-15	---	---	---
Ud:								
Ulysses---------	0-7	4.0-18	---	6.6-7.8	---	---	---	---
	7-25	8.0-19	---	7.4-8.4	0-15	---	---	---
	25-60	7.0-16	---	7.9-8.4	0-15	---	---	---
Uh:								
Ulysses---------	0-6	11-23	---	6.6-7.8	---	---	---	---
	6-16	8.0-19	---	7.4-8.4	0-15	---	---	---
	16-60	7.0-16	---	7.9-8.4	0-15	---	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued
Logan County, Kansas

Map symbol and soil name	Depth	Cation-exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
Ul:								
Ulysses	0-7	4.0-18	---	6.6-7.8	---	---	---	---
	7-25	8.0-19	---	7.4-8.4	0-15	---	---	---
	25-60	7.0-16	---	7.9-8.4	0-15	---	---	---
Colby	0-5	6.0-18	---	7.4-8.4	0-5	---	---	---
	5-60	7.0-16	---	7.4-8.4	5-15	---	---	---
Um:								
Ulysses	0-7	4.0-18	---	6.6-7.8	---	---	---	---
	7-25	8.0-19	---	7.4-8.4	0-15	---	---	---
	25-60	7.0-16	---	7.9-8.4	0-15	---	---	---
Colby	0-5	6.0-18	---	7.4-8.4	0-5	---	---	---
	5-60	7.0-16	---	7.4-8.4	5-15	---	---	---
Vl:								
Goshen	0-16	6.0-17	---	6.1-7.8	0	0	0	0
	16-26	10-21	---	6.6-8.4	0-10	0	0	0
	26-60	6.0-16	---	7.4-8.4	0-10	0	0	0
Vs:								
Goshen	0-16	6.0-17	---	6.1-7.8	0	0	0	0
	16-26	10-21	---	6.6-8.4	0-10	0	0	0
	26-60	6.0-16	---	7.4-8.4	0-10	0	0	0
Drummond	0-5	8.0-19	---	6.1-8.4	---	---	0.0-4.0	---
	5-26	14-36	---	7.4-9.0	---	---	2.0-8.0	---
	26-60	---	0.0-0.0	---	---	---	---	---
W:								
Water	---	---	---	---	---	---	---	---
Wa:								
Sweetwater	0-24	7.0-24	---	7.4-8.4	0-5	0	0	0
	24-60	1.0-9.0	---	7.9-8.4	0-5	0	0	0

WATER FEATURES
Logan County, Kansas

The Water Features table gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long–duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink–swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The months in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The Water Features table indicates, by month, depth to the top (upper limit) and base (lower limit) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The Water Features table indicates surface water depth and the duration and frequency of ponding. Duration is expressed as very brief if less than 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. None means that ponding is not probable; rare that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); occasional that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and frequent that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and frequency are estimated. Duration is expressed as extremely brief if 0.1 hour to 4 hours, very brief if 4 hours to 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. None means that flooding is not probable; very rare that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); rare that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); occasional that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); frequent that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and very frequent that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood–prone areas at specific flood frequency levels.

WATER FEATURES--Continued
Logan County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
063CC:									
Campus	B		---	---	---	---	---	---	---
Canlon	D		---	---	---	---	---	---	---
063EC:									
Elkader	B		---	---	---	---	---	---	---
063ED:									
Elkader	B		---	---	---	---	---	---	---
Manvel	B		---	---	---	---	---	---	---
063IN:									
Inavale	A								
		January	---	---	---	---	---	Very brief	Frequent
		February	---	---	---	---	---	Very brief	Frequent
		March	---	---	---	---	---	Very brief	Frequent
		April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
063MB:									
Manvel	B		---	---	---	---	---	---	---
Badland	---		---	---	---	---	---	---	---
063RB:									
Roxbury	B								
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
063UD:									
Ulysses	B		---	---	---	---	---	---	---
063UE:									
Ulysses	B		---	---	---	---	---	---	---
171AN:									
Bridgeport	B								
		April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
		September	---	---	---	---	---	Very brief	Frequent
171MM:									
Campus	B		---	---	---	---	---	---	---
Canlon	D		---	---	---	---	---	---	---
181RH:									
Rough Broken Land	B		---	---	---	---	---	---	---
Gravelly Land	B		---	---	---	---	---	---	---
193CD:									
Colby	B		---	---	---	---	---	---	---
193US:									
Ulysses	B		---	---	---	---	---	---	---
199BB:									
Bankard	A								
		March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
199BC:									

WATER FEATURES--Continued
Logan County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Bankard	A								
		January	---	---	---	---	---	---	Rare
		February	---	---	---	---	---	---	Rare
		March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	Very brief	Rare
		May	---	---	---	---	---	Very brief	Rare
		June	---	---	---	---	---	Very brief	Rare
		July	---	---	---	---	---	Very brief	Rare
		August	---	---	---	---	---	Very brief	Rare
		September	---	---	---	---	---	Very brief	Rare
		October	---	---	---	---	---	---	Rare
		November	---	---	---	---	---	---	Rare
		December	---	---	---	---	---	---	Rare
199BO:									
Bridgeport	B								
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
199BP:									
Bridgeport	B								
		March	---	---	---	---	---	Very brief	Rare
		April	---	---	---	---	---	Very brief	Rare
		May	---	---	---	---	---	Very brief	Rare
		June	---	---	---	---	---	Very brief	Rare
		July	---	---	---	---	---	Very brief	Rare
		August	---	---	---	---	---	Very brief	Rare
		September	---	---	---	---	---	Very brief	Rare
		October	---	---	---	---	---	Very brief	Rare
199CD:									
Canyon	D		---	---	---	---	---	---	---
199KO:									
Kim	B		---	---	---	---	---	---	---
Otero	B		---	---	---	---	---	---	---
199KU:									
Kuma	B		---	---	---	---	---	---	---
199MC:									
Manter	B		---	---	---	---	---	---	---
203MM:									
Campus	B		---	---	---	---	---	---	---
Canlon	D		---	---	---	---	---	---	---
An:									
Bridgeport	B								
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
Bl:									
Badland	---		---	---	---	---	---	---	---
Bp:									
Bridgeport	B								
		April	---	---	---	---	---	Very brief	Rare
		May	---	---	---	---	---	Very brief	Rare
		June	---	---	---	---	---	Very brief	Rare
		July	---	---	---	---	---	Very brief	Rare
		August	---	---	---	---	---	Very brief	Rare
		September	---	---	---	---	---	Very brief	Rare
Bv:									
Angelus	B								
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
CAA:									

WATER FEATURES--Continued
Logan County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Caruso	C								
		March	2.0-3.0	>6.0	---	---	---	---	None
		April	2.0-3.0	>6.0	---	---	---	Very brief	Occasional
		May	2.0-3.0	>6.0	---	---	---	Very brief	Occasional
		June	2.0-3.0	>6.0	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
Cc:									
Colby	B		---	---	---	---	---	---	---
Cd:									
Colby	B		---	---	---	---	---	---	---
COD:									
Colby	B		---	---	---	---	---	---	---
Dw:									
Dwyer	A		---	---	---	---	---	---	---
Ea:									
Elkader	B		---	---	---	---	---	---	---
Eb:									
Elkader	B		---	---	---	---	---	---	---
Ec:									
Elkader	B		---	---	---	---	---	---	---
Ed:									
Elkader	B		---	---	---	---	---	---	---
Gr:									
Schamber	A		---	---	---	---	---	---	---
Ka:									
Keith	B		---	---	---	---	---	---	---
Kb:									
Keith	B		---	---	---	---	---	---	---
Lb:									
Las	C								
		March	2.0-3.0	>6.0	---	---	---	---	None
		April	2.0-3.0	>6.0	---	---	---	Very brief	Occasional
		May	2.0-3.0	>6.0	---	---	---	Very brief	Occasional
		June	2.0-3.0	>6.0	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
Ld:									
Las Animas	C								
		January	1.5-3.0	>6.0	---	---	---	---	None
		February	1.5-3.0	>6.0	---	---	---	---	None
		March	1.5-3.0	>6.0	---	---	---	Brief	Occasional
		April	1.5-3.0	>6.0	---	---	---	Brief	Occasional
		May	1.5-3.0	>6.0	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		November	1.5-3.0	>6.0	---	---	---	---	None
		December	1.5-3.0	>6.0	---	---	---	---	None
Lk:									
Likes	A		---	---	---	---	---	---	---
Ll:									
Lincoln	A								
		January	5.0-6.0	>6.0	---	---	---	---	None
		February	5.0-6.0	>6.0	---	---	---	---	None
		March	5.0-6.0	>6.0	---	---	---	---	None
		April	5.0-6.0	>6.0	---	---	---	Brief	Frequent
		May	5.0-6.0	>6.0	---	---	---	Brief	Frequent
		June	---	---	---	---	---	Brief	Frequent
		July	---	---	---	---	---	Brief	Frequent
		August	---	---	---	---	---	Brief	Frequent
		September	---	---	---	---	---	Brief	Frequent
		October	---	---	---	---	---	Brief	Frequent
		November	5.0-6.0	>6.0	---	---	---	---	None
		December	5.0-6.0	>6.0	---	---	---	---	None
Lm:									
Midway	D		---	---	---	---	---	---	---
Ln:									
Simeon	A								

WATER FEATURES--Continued
Logan County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
			---	---	---	---	---	---	---
Lo:									
Pleasant	D								
		April	0.0	>6.0	0.0-2.0	Long	Occasional	---	None
		May	0.0	>6.0	0.0-2.0	Long	Occasional	---	None
		June	0.0	>6.0	0.0-2.0	Long	Occasional	---	None
		July	0.0	>6.0	0.0-2.0	Long	Occasional	---	None
		August	0.0	>6.0	0.0-2.0	Long	Occasional	---	None
		September	0.0	>6.0	0.0-2.0	Long	Occasional	---	None
Lu:									
Lubbock	B		---	---	---	---	---	---	---
Mh:									
Manter	B		---	---	---	---	---	---	---
Mk:									
Manter	B		---	---	---	---	---	---	---
Mn:									
Manvel	B		---	---	---	---	---	---	---
Mp:									
Minnequa	C		---	---	---	---	---	---	---
Penrose	D		---	---	---	---	---	---	---
Ot:									
Otero	B		---	---	---	---	---	---	---
Po:									
Canyon	D		---	---	---	---	---	---	---
Pr:									
Limon	C		---	---	---	---	---	---	---
Ps:									
Limon	C		---	---	---	---	---	---	---
Pt:									
Razor	C		---	---	---	---	---	---	---
Ra:									
Ness	D								
		January	---	---	0.0-	---	---	---	None
		February	---	---	0.0-	---	---	---	None
		March	0.0	>6.0	0.0-1.0	Long	Occasional	---	None
		April	0.0	>6.0	0.0-1.0	Long	Occasional	---	None
		May	0.0	>6.0	0.0-1.0	Long	Occasional	---	None
		June	0.0	>6.0	0.0-1.0	Long	Occasional	---	None
		July	---	---	0.0-	---	---	---	None
		August	---	---	0.0-	---	---	---	None
		September	---	---	0.0-	---	---	---	None
		October	---	---	0.0-	---	---	---	None
		November	---	---	0.0-	---	---	---	None
		December	---	---	0.0-	---	---	---	None
Rc:									
Richfield	B		---	---	---	---	---	---	---
SMH:									
Smoky Hill River	D								
		January	0.0-6.0	>6.0	---	---	---	Brief	Occasional
		February	0.0-6.0	>6.0	---	---	---	Brief	Occasional
		March	0.0-6.0	>6.0	---	---	---	Brief	Occasional
		April	0.0-6.0	>6.0	---	---	---	Brief	Occasional
		May	0.0-6.0	>6.0	---	---	---	Brief	Occasional
		June	0.0-6.0	>6.0	---	---	---	Brief	Occasional
		July	0.0-6.0	>6.0	---	---	---	Brief	Occasional
		August	0.0-6.0	>6.0	---	---	---	---	None
		September	0.0-6.0	>6.0	---	---	---	---	None
		October	0.0-6.0	>6.0	---	---	---	Brief	Occasional
		November	0.0-6.0	>6.0	---	---	---	Brief	Occasional
		December	0.0-6.0	>6.0	---	---	---	Brief	Occasional
Ua:									
Ulysses	B		---	---	---	---	---	---	---
Ub:									
Ulysses	B		---	---	---	---	---	---	---
Uc:									
Ulysses	B		---	---	---	---	---	---	---
UCC:									
Ulysses	B		---	---	---	---	---	---	---

WATER FEATURES--Continued
Logan County, Kansas

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Ud:									
Ulysses	B		---	---	---	---	---	---	---
Uh:									
Ulysses	B		---	---	---	---	---	---	---
Ul:									
Ulysses	B		---	---	---	---	---	---	---
Colby	B		---	---	---	---	---	---	---
Um:									
Ulysses	B		---	---	---	---	---	---	---
Colby	B		---	---	---	---	---	---	---
Vl:									
Goshen	B								
		April	---	---	---	---	---	Very brief	Rare
		May	---	---	---	---	---	Very brief	Rare
		June	---	---	---	---	---	Very brief	Rare
		July	---	---	---	---	---	Very brief	Rare
		August	---	---	---	---	---	Very brief	Rare
		September	---	---	---	---	---	Very brief	Rare
Vs:									
Goshen	B								
		April	---	---	---	---	---	Very brief	Rare
		May	---	---	---	---	---	Very brief	Rare
		June	---	---	---	---	---	Very brief	Rare
		July	---	---	---	---	---	Very brief	Rare
		August	---	---	---	---	---	Very brief	Rare
		September	---	---	---	---	---	Very brief	Rare
Drummond	D								
		January	2.0-6.0	>6.0	---	---	---	---	None
		February	2.0-6.0	>6.0	---	---	---	---	None
		March	2.0-6.0	>6.0	---	---	---	---	None
		April	2.0-6.0	>6.0	---	---	---	Very brief	Rare
		May	---	---	---	---	---	Very brief	Rare
		June	---	---	---	---	---	Very brief	Rare
		July	---	---	---	---	---	Very brief	Rare
		August	---	---	---	---	---	Very brief	Rare
		September	---	---	---	---	---	Very brief	Rare
		November	2.0-6.0	>6.0	---	---	---	---	None
		December	2.0-6.0	>6.0	---	---	---	---	None
W:									
Water	---		---	---	---	---	---	---	---
Wa:									
Sweetwater	D								
		January	0.5-3.0	>6.0	---	---	---	---	None
		February	0.5-3.0	>6.0	---	---	---	---	None
		March	0.5-3.0	>6.0	---	---	---	---	None
		April	0.5-3.0	>6.0	---	---	---	Brief	Occasional
		May	0.5-3.0	>6.0	---	---	---	Brief	Occasional
		June	0.5-3.0	>6.0	---	---	---	Brief	Occasional
		July	0.5-3.0	>6.0	---	---	---	Brief	Occasional
		August	0.5-3.0	>6.0	---	---	---	Brief	Occasional
		September	0.5-3.0	>6.0	---	---	---	Brief	Occasional
		October	0.5-3.0	>6.0	---	---	---	Brief	Occasional
		November	0.5-3.0	>6.0	---	---	---	---	None
		December	0.5-3.0	>6.0	---	---	---	---	None

SOIL FEATURES
Logan County, Kansas

The following table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A restrictive layer is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. Depth to top is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as low, moderate, or high, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as low, moderate, or high. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

SOIL FEATURES--Continued
Logan County, Kansas

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
		In	In				
063CC:							
Campus	20-40	Bedrock (lithic)	---	Strongly cemented	Low	Low	Low
Canlon	10-20	Bedrock (lithic)	---	Indurated	Low	Low	Low
063EC:							
Elkader	---	---	---	---	Moderate	Low	Low
063ED:							
Elkader	---	---	---	---	Moderate	Low	Low
Manvel	---	---	---	---	Low	High	Low
063IN:							
Inavale	---	---	---	---	Low	Moderate	Low
063MB:							
Manvel	---	---	---	---	Low	High	Low
Badland	0-3	Bedrock (paralithic)	---	Weakly cemented	---	---	---
063RB:							
Roxbury	---	---	---	---	Moderate	Low	Low
063UD:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
063UE:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
171AN:							
Bridgeport	---	---	---	---	Moderate	Low	Low
171MM:							
Campus	20-40	Bedrock (lithic)	---	Strongly cemented	Low	Low	Low
Canlon	10-21	Bedrock (lithic)	---	Indurated	Low	Low	Low
181RH:							
Rough Broken Land	---	---	---	---	Low	High	Low
Gravelly Land	---	---	---	---	Low	High	Low
193CD:							
Colby	---	---	---	---	Low	Low	Low
193US:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
199BB:							
Bankard	---	---	---	---	Low	Moderate	Low
199BC:							
Bankard	---	---	---	---	Low	Moderate	Low
199BO:							
Bridgeport	---	---	---	---	Moderate	Low	Low
199BP:							
Bridgeport	---	---	---	---	Moderate	Low	Low
199CD:							
Canyon	6-20	Bedrock (paralithic)	---	Weakly cemented	Low	High	Low
199KO:							
Kim	---	---	---	---	Low	High	Low
Otero	---	---	---	---	Low	High	Low
199KU:							
Kuma	---	---	---	---	Moderate	High	Moderate
199MC:							
Manter	---	---	---	---	Moderate	High	Low
203MM:							
Campus	20-40	Bedrock (lithic)	---	Strongly cemented	Moderate	Low	Low
Canlon	4-20	Bedrock (lithic)	---	Indurated	Moderate	Low	Low
An:							
Bridgeport	---	---	---	---	Moderate	Low	Low
Bl:							
Badland	---	---	---	---	---	---	---
Bp:							
Bridgeport	---	---	---	---	Moderate	Low	Low
Bv:							
Angelus	---	---	---	---	Moderate	Low	Low
CAA:							
Caruso	---	---	---	---	Moderate	High	Moderate
Cc:							
Colby	---	---	---	---	Low	Low	Low
Cd:							
Colby	---	---	---	---	Low	Low	Low
COD:							
Colby	---	---	---	---	Low	Low	Low
Dw:							
Dwyer	---	---	---	---	Low	High	Low
Ea:							
Elkader	---	---	---	---	Moderate	Low	Low
Eb:							
Elkader	---	---	---	---	Moderate	Low	Low
Ec:							
Elkader	---	---	---	---	Moderate	Low	Low
Ed:							
Elkader	---	---	---	---	Moderate	Low	Low
Gr:							
Schamber	---	---	---	---	Low	Moderate	Low
Ka:							
Keith	---	---	---	---	Moderate	Moderate	Low
Kb:							
Keith	---	---	---	---	Moderate	Moderate	Low

SOIL FEATURES--Continued
Logan County, Kansas

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
		In	In				
Lb:							
Las	---	---	---	---	Moderate	High	Moderate
Ld:							
Las Animas	---	---	---	---	Moderate	High	Low
Lk:							
Likes	---	---	---	---	None	Low	Low
Ll:							
Lincoln	---	---	---	---	---	Low	Low
Lm:							
Midway	6-20	Bedrock (paralithic)	---	Weakly cemented	Low	High	Low
Ln:							
Simeon	---	---	---	---	Low	Low	Low
Lo:							
Pleasant	---	---	---	---	Low	High	Low
Lu:							
Lubbock	---	---	---	---	Low	High	Low
Mh:							
Manter	---	---	---	---	Moderate	Moderate	Low
Mk:							
Manter	---	---	---	---	Moderate	High	Low
Mn:							
Manvel	---	---	---	---	Low	High	Low
Mp:							
Minnequa	20-40	Bedrock (paralithic)	---	---	Low	High	Low
Penrose	10-20	Bedrock (paralithic)	---	Strongly cemented	Low	High	Low
Ot:							
Otero	---	---	---	---	Low	High	Low
Po:							
Canyon	6-20	Bedrock (paralithic)	---	Weakly cemented	Low	High	Low
Pr:							
Limon	---	---	---	---	Low	High	Moderate
Ps:							
Limon	---	---	---	---	Low	High	Moderate
Pt:							
Razor	20-40	Bedrock (paralithic)	---	Very weakly cemented	Low	High	High
Ra:							
Ness	---	---	---	---	Moderate	High	Low
Rc:							
Richfield	---	---	---	---	Low	High	Low
SMH:							
Smoky Hill River	---	---	---	---	---	---	---
Ua:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
Ub:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
Uc:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
UCC:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
Ud:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
Uh:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
Ul:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
Colby	---	---	---	---	Low	Low	Low
Um:							
Ulysses	---	---	---	---	Moderate	Moderate	Low
Colby	---	---	---	---	Low	Low	Low
Vl:							
Goshen	---	---	---	---	Moderate	High	Low
Vs:							
Goshen	---	---	---	---	Moderate	High	Low
Drummond	---	---	---	---	None	High	High
W:							
Water	---	---	---	---	---	---	---
Wa:							
Sweetwater	---	---	---	---	None	High	Low

WATER MANAGEMENT
Logan County, Kansas

The soils of the survey area are rated in the Water Management table according to limitations that affect their suitability for water management. Soils are rated for pond reservoir areas, drainage, irrigation, terraces and diversions, and grassed waterways. Restrictive features that affect each soil for the specified use is also provided in the table.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Moderately limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Limited indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but generally require special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate to high maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Limitation class terms, such as very limited or limited, etc., limitation ratings, and numerical ratings are shown for each soil feature listed. As many as three soil features may be listed for each soil component if applicable. The overall limitation rating for the soil component is based on the most severe limitation.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorablecompaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects theamount of usable material. It also affects traffic ability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditch banks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a very limited hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, which conduct surface water to outlets at a non-erosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

WATER MANAGEMENT--Continued
Logan County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
063CC:				
Campus	Limitation: deep to water	Limitation: slope depth to rock	Limitation: depth to rock	Limitation: depth to rock
Canlon	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
063EC:				
Elkader	Limitation: deep to water	Limitation: excess salt slope	Limitation: erodes easily	Limitation: erodes easily too arid
063ED:				
Elkader	Limitation: deep to water	Limitation: excess salt slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Manvel	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
063IN:				
Inavale	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
063MB:				
Manvel	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Badland	---	---	---	---
063RB:				
Roxbury	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily
063UD:				
Ulysses	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
063UE:				
Ulysses	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
171AN:				
Bridgeport	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily
171MM:				
Campus	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Canlon	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
181RH:				
Rough Broken Land	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope too arid
Gravelly Land	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: slope soil blowing	Limitation: slope too arid droughty
193CD:				
Colby	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
193US:				
Ulysses	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
199BB:				
Bankard	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: rooting depth too arid droughty
199BC:				
Bankard	Limitation: deep to water	Limitation: soil blowing droughty	Limitation: too sandy soil blowing	Limitation: too arid droughty
199BO:				
Bridgeport	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily

WATER MANAGEMENT--Continued
Logan County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
199BP:				
Bridgeport	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
199CD:				
Canyon	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope too arid depth to rock
199KO:				
Kim	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope too arid
Otero	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: slope soil blowing	Limitation: slope too arid droughty
199KU:				
Kuma	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
199MC:				
Manter	Limitation: deep to water	Limitation: slope soil blowing	Limitation: too sandy soil blowing	Limitation: too arid
203MM:				
Campus	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Canlon	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
An:				
Bridgeport	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily
Bl:				
Badland	---	---	---	---
Bp:				
Bridgeport	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Bv:				
Angelus	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
CAA:				
Caruso	Limitation: flooding	Limitation: flooding wetness	Limitation: wetness	Favorable
Cc:				
Colby	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid
Cd:				
Colby	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
COD:				
Colby	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Dw:				
Dwyer	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope too arid droughty
Ea:				
Elkader	Limitation: deep to water	Limitation: excess salt	Limitation: erodes easily	Limitation: erodes easily too arid
Eb:				
Elkader	Limitation: deep to water	Limitation: excess salt	Limitation: erodes easily	Limitation: erodes easily too arid
Ec:				
Elkader	Limitation: deep to water	Limitation: excess salt slope	Limitation: erodes easily	Limitation: erodes easily too arid
Ed:				
Elkader	Limitation: deep to water	Limitation: excess salt slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid

WATER MANAGEMENT--Continued
Logan County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Gr:				
Schamber	Limitation: deep to water	Limitation: slope droughty	Limitation: slope too sandy	Limitation: slope too arid droughty
Ka:				
Keith	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
Kb:				
Keith	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
Lb:				
Las	Limitation: flooding cutbanks cave	Limitation: flooding wetness	Limitation: too sandy wetness	Favorable
Ld:				
Las Animas	Limitation: flooding cutbanks cave	Limitation: flooding wetness soil blowing	Limitation: too sandy wetness soil blowing	Favorable
Lk:				
Likes	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
Ll:				
Lincoln	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
Lm:				
Midway	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope too arid
Ln:				
Simeon	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope droughty
Lo:				
Pleasant	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily wetness too arid
Lu:				
Lubbock	Limitation: deep to water	Favorable	Favorable	Favorable
Mh:				
Manter	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Limitation: too arid
Mk:				
Manter	Limitation: deep to water	Limitation: slope soil blowing	Limitation: too sandy soil blowing	Limitation: too arid
Mn:				
Manvel	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid
Mp:				
Minnequa	Limitation: deep to water	Limitation: erodes easily slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily too arid depth to rock
Penrose	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope too arid depth to rock
Ot:				
Otero	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: soil blowing	Limitation: too arid droughty
Po:				
Canyon	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope too arid depth to rock
Pr:				
Limon	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: percs slowly	Limitation: excess salt percs slowly too arid

WATER MANAGEMENT--Continued
Logan County, Kansas

(The information in this report indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ps:				
Limon	Limitation: deep to water	Limitation: excess salt percs slowly slow intake	Limitation: percs slowly	Limitation: excess salt percs slowly too arid
Pt:				
Razor	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: erodes easily percs slowly depth to rock	Limitation: erodes easily too arid depth to rock
Ra:				
Ness	Limitation: percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
Rc:				
Richfield	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
SMH:				
Smoky Hill River	Limitation: flooding cutbanks cave	Limitation: fast intake wetness droughty	Limitation: too sandy wetness	Limitation: wetness droughty
Ua:				
Ulysses	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
Ub:				
Ulysses	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
Uc:				
Ulysses	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
UCC:				
Ulysses	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Ud:				
Ulysses	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Uh:				
Ulysses	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily too arid
Ul:				
Ulysses	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily too arid
Colby	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily too arid
Um:				
Ulysses	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Colby	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope too arid
Vl:				
Goshen	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Vs:				
Goshen	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Drummond	Limitation: excess sodium percs slowly	Limitation: percs slowly wetness droughty	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily excess sodium droughty
W:				
Water	---	---	---	---
Wa:				
Sweetwater	Limitation: flooding cutbanks cave	Limitation: flooding wetness	Limitation: too sandy wetness	Limitation: wetness

WATER MANAGEMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
063CC:							
Campus	60	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.86	Thin layer	0.86	Deep to water	1.00
		Seepage	0.70	Piping	0.68		
Canlon	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00	Piping	0.92		
		Slope	0.18				
063EC:							
Elkader	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.76	Deep to water	1.00
				Salinity	0.03		
063ED:							
Elkader	55	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.76	Deep to water	1.00
		Slope	0.00	Salinity	0.03		
Manvel	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.05	Piping	0.88	Deep to water	1.00
063IN:							
Inavale	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.45	Deep to water	1.00
063MB:							
Manvel	65	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.05	Piping	0.88	Deep to water	1.00
Badland	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00				
		Slope	0.21				
063RB:							
Roxbury	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.63	Deep to water	1.00
063UC:							
Ulysses	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
063UD:							
Ulysses	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.41	Deep to water	1.00
063UE:							
Ulysses	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.41	Deep to water	1.00
171AN:							
Bridgeport	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.70	Deep to water	1.00
171MM:							
Campus	75	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.91	Thin layer	0.91	Deep to water	1.00
		Seepage	0.70	Piping	0.68		
Canlon	25	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Deep to water	1.00
		Seepage	0.70	Piping	0.92		
		Slope	0.21				
181RH:							
Rough Broken Land	65	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
		Slope	0.01				
Gravelly Land	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.09	Deep to water	1.00
		Slope	0.04				
193CD:							
Colby	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
		Slope	0.00				

WATER MANAGEMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
193US:							
Ulysses	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
199BB:							
Bankard	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.49	Deep to water	1.00
199BC:							
Bankard	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.09	Deep to water	1.00
199BO:							
Bridgeport	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.73	Deep to water	1.00
199BP:							
Bridgeport	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.70	Deep to water	1.00
199CD:							
Canyon	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.69	Piping	1.00		
		Slope	0.08				
199CP:							
Colby	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
		Slope	0.00				
199KO:							
Kim	70	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
		Slope	0.01				
Otero	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.09	Deep to water	1.00
		Slope	0.01				
199KU:							
Kuma	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.99	Deep to water	1.00
199MC:							
Manter	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.09	Deep to water	1.00
203MM:							
Campus	60	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.86	Thin layer	0.86	Deep to water	1.00
		Seepage	0.70	Piping	0.68		
Canlon	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00				
		Slope	0.02				
An:							
Bridgeport	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.70	Deep to water	1.00
Bl:							
Badland	100	Not rated		Not rated		Not rated	
Bp:							
Bridgeport	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.74	Deep to water	1.00
Bv:							
Angelus	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
CAA:							
Caruso	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.57	Piping	0.88	Slow refill	0.43
				Depth to saturated zone	0.86	Cutbanks cave	0.10

WATER MANAGEMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
						Deep to water	0.06
Cc:							
Colby	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
Cd:							
Colby	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
COD:							
Colby	100	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Piping	1.00	Deep to water	1.00
		Slope	0.00				
Dw:							
Dwyer	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Deep to water	1.00
		Slope	0.01				
Ea:							
Elkader	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.76	Deep to water	1.00
				Salinity	0.03		
Eb:							
Elkader	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.76	Deep to water	1.00
				Salinity	0.03		
Ec:							
Elkader	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.76	Deep to water	1.00
				Salinity	0.03		
Ed:							
Elkader	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.76	Deep to water	1.00
				Salinity	0.03		
Gr:							
Schamber	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.98	Deep to water	1.00
		Slope	0.03				
Ka:							
Keith	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.96	Deep to water	1.00
Kb:							
Keith	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.97	Deep to water	1.00
Lb:							
Las	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.93	Cutbanks cave	1.00
				Depth to saturated zone	0.86	Deep to water	0.06
Ld:							
Las Animas	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Cutbanks cave	1.00
				Depth to saturated zone	0.95	Deep to water	0.02
Lk:							
Likes	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.56	Deep to water	1.00
Ll:							
Lincoln	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.56	Deep to water	1.00
Lm:							
Midway	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.78				
		Slope	0.08				

WATER MANAGEMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ln:							
Simeon	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.98	Deep to water	1.00
Lo:							
Pleasant	100	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Ponding	1.00	Slow refill	0.30
				Depth to saturated zone	1.00	Cutbanks cave	0.10
Lu:							
Lubbock	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.11	Deep to water	1.00
Mh:							
Manter	100	Very limited		Not limited		Very limited	
		Seepage	1.00			Deep to water	1.00
Mk:							
Manter	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.09	Deep to water	1.00
Mn:							
Manvel	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.05	Piping	0.88	Deep to water	1.00
Mp:							
Minnequa	60	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.88	Deep to water	1.00
		Depth to bedrock	0.11	Thin layer	0.86		
Penrose	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.78	Piping	1.00		
		Slope	0.04				
Ot:							
Otero	100	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.08	Deep to water	1.00
Po:							
Canyon	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.78	Piping	1.00		
		Slope	0.12				
Pr:							
Limon	100	Not limited		Not limited		Very limited	
						Deep to water	1.00
Ps:							
Limon	100	Not limited		Not limited		Very limited	
						Deep to water	1.00
Pt:							
Razor	100	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.01	Piping	1.00	Deep to water	1.00
				Salinity	0.50		
				Thin layer	0.46		
Ra:							
Ness	100	Not limited		Very limited		Very limited	
				Ponding	1.00	Slow refill	1.00
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Hard to pack	0.97		
Rc:							
Richfield	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.11	Deep to water	1.00
SMH:							
Smoky Hill River	100	Not rated		Not rated		Not rated	
Ua:							
Ulysses	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.98	Deep to water	1.00

WATER MANAGEMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ub:							
Ulysses	100	Somewhat limited Seepage	 0.70	Somewhat limited Piping	 0.98	Very limited Deep to water	 1.00
Uc:							
Ulysses	100	Somewhat limited Seepage	 0.70	Somewhat limited Piping	 0.98	Very limited Deep to water	 1.00
UCC:							
Ulysses	100	Somewhat limited Seepage	 0.70	Very limited Piping	 1.00	Very limited Deep to water	 1.00
Ud:							
Ulysses	100	Somewhat limited Seepage	 0.70	Somewhat limited Piping	 0.98	Very limited Deep to water	 1.00
Uh:							
Ulysses	100	Somewhat limited Seepage	 0.70	Very limited Piping	 1.00	Very limited Deep to water	 1.00
Ul:							
Ulysses	70	Somewhat limited Seepage	 0.70	Somewhat limited Piping	 0.98	Very limited Deep to water	 1.00
Colby	30	Somewhat limited Seepage	 0.70	Very limited Piping	 1.00	Very limited Deep to water	 1.00
Um:							
Ulysses	60	Somewhat limited Seepage	 0.70	Somewhat limited Piping	 0.98	Very limited Deep to water	 1.00
Colby	40	Somewhat limited Seepage	 0.70	Very limited Piping	 1.00	Very limited Deep to water	 1.00
Vl:							
Goshen	100	Somewhat limited Seepage	 0.70	Somewhat limited Piping	 0.99	Very limited Deep to water	 1.00
Vs:							
Goshen	70	Somewhat limited Seepage	 0.70	Somewhat limited Piping	 0.99	Very limited Deep to water	 1.00
Drummond	30	Not limited		Not limited		Somewhat limited Deep to water Cutbanks cave Salty water	 0.81 0.10 0.01
W:							
Water	100	Very limited Seepage Slope	 1.00 0.50	Very limited Hard to pack	 1.00	Very limited Deep to water	 1.00
Wa:							
Sweetwater	100	Very limited Seepage	 1.00	Very limited Depth to saturated zone Seepage	 1.00 0.46	Very limited Cutbanks cave	 1.00

SANITARY FACILITIES
Logan County, Kansas

Sanitary Facilities

The following tables show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A trench sanitary landfill is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

SANITARY FACILITIES
Logan County, Kansas

In an area sanitary landfill, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

SANITARY FACILITIES--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
063CC:					
Campus	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
Canlon	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
063EC:					
Elkader	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.67
				Seepage	0.50
063ED:					
Elkader	55	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
Manvel	45	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.00		
063IN:					
Inavale	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
063MB:					
Manvel	65	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.00		
Badland	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
063RB:					
Roxbury	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
063UD:					
Ulysses	100	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.00	Seepage	0.50
063UE:					
Ulysses	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
171AN:					
Bridgeport	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
171MM:					
Campus	75	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
Canlon	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
181RH:					
Rough Broken Land	65	Somewhat limited		Very limited	
		Slope	0.84	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Gravelly Land	35	Very limited		Very limited	
		Slope	1.00	Seepage	1.00
				Slope	1.00

SANITARY FACILITIES--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
193CD:					
Colby	100	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
193US:					
Ulysses	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.67
				Seepage	0.50
199BB:					
Bankard	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
199BC:					
Bankard	100	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40
199BO:					
Bridgeport	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
199BP:					
Bridgeport	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
199CD:					
Canyon	100	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
199KO:					
Kim	70	Somewhat limited		Very limited	
		Slope	0.84	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Otero	30	Somewhat limited		Very limited	
		Slope	0.84	Seepage	1.00
				Slope	1.00
199KU:					
Kuma	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
199MC:					
Manter	100	Not limited		Very limited	
				Seepage	1.00
				Slope	0.33
203MM:					
Campus	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Restricted permeability	0.50	Slope	1.00
		Slope	0.04	Seepage	0.50
Canlon	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.96	Slope	1.00
An:					
Bridgeport	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
Bl:					
Badland	100	Not rated		Not rated	
Bp:					
Bridgeport	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
Bv:					
Angelus	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00

SANITARY FACILITIES--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
		Restricted permeability	0.50	Seepage	0.50
CAA:					
Caruso	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.68	Seepage	0.32
Cc:					
Colby	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
Cd:					
Colby	100	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
COD:					
Colby	100	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.37	Seepage	0.50
Dw:					
Dwyer	100	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	0.84	Slope	1.00
Ea:					
Elkader	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
Eb:					
Elkader	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.00
Ec:					
Elkader	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
Ed:					
Elkader	100	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
Gr:					
Schamber	100	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	1.00	Slope	1.00
Ka:					
Keith	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
Kb:					
Keith	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.00
Lb:					
Las	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00		
Ld:					
Las Animas	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
Lk:					
Likes	100	Very limited		Very limited	

SANITARY FACILITIES--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.00
Ll:					
Lincoln	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
		Depth to saturated zone	0.08		
Lm:					
Midway	100	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Ln:					
Simeon	100	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Slope	0.16	Slope	1.00
Lo:					
Pleasant	100	Very limited		Very limited	
		Restricted permeability	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.50
Lu:					
Lubbock	100	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
Mh:					
Manter	100	Not limited		Very limited	
				Seepage	1.00
				Slope	0.00
Mk:					
Manter	100	Not limited		Very limited	
				Seepage	1.00
				Slope	0.33
Mn:					
Manvel	100	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.09
Mp:					
Minnequa	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
Penrose	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Ot:					
Otero	100	Not limited		Very limited	
				Seepage	1.00
				Slope	0.91
Po:					
Canyon	100	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Pr:					
Limon	100	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.09
Ps:					
Limon	100	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.00
Pt:					
Razor	100	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.33
Ra:					
Ness	100	Very limited		Very limited	

SANITARY FACILITIES--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
		Restricted permeability	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
Rc:					
Richfield	100	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
SMH:					
Smoky Hill River	100	Not rated		Not rated	
Ua:					
Ulysses	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
Ub:					
Ulysses	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.00
Uc:					
Ulysses	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
UCC:					
Ulysses	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Slope	0.67
				Seepage	0.50
Ud:					
Ulysses	100	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
Uh:					
Ulysses	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.00
Ul:					
Ulysses	70	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
Colby	30	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.33
Um:					
Ulysses	60	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
Colby	40	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
		Slope	0.16	Seepage	0.50
Vl:					
Goshen	100	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
Vs:					
Goshen	70	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
		Flooding	0.40	Flooding	0.40
Drummond	30	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.71
		Depth to saturated zone	1.00	Flooding	0.40
		Flooding	0.40		

SANITARY FACILITIES--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
W:					
Water	100	Very limited		Very limited	
		Slope	1.00	Slope	1.00
Wa:					
Sweetwater	100	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00		

SANITARY FACILITIES--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
063CC:							
Campus	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00			Too clayey	0.50
		Too clayey	0.50				
Canlon	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00				
063EC:							
Elkader	100	Not limited		Not limited		Not limited	
063ED:							
Elkader	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37	Slope	0.37
Manvel	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.00	Slope	0.00	Slope	0.00
063IN:							
Inavale	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Too Sandy	0.50
		Too Sandy	1.00				
063MB:							
Manvel	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.00	Slope	0.00	Slope	0.00
Badland	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00				
063RB:							
Roxbury	100	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
063UD:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.00	Slope	0.00	Slope	0.00
063UE:							
Ulysses	100	Not limited		Not limited		Not limited	
171AN:							
Bridgeport	100	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
171MM:							
Campus	75	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.16	Too clayey	0.50
		Too clayey	0.50			Slope	0.16
		Slope	0.16				
Canlon	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00				
181RH:							
Rough Broken Land	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.84	Slope	0.84	Slope	0.84
Gravelly Land	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Seepage	0.50
193CD:							
Colby	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37	Slope	0.37
193US:							
Ulysses	100	Not limited		Not limited		Not limited	
199BB:							
Bankard	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
199BC:							
Bankard	100	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Seepage	1.00
199BO:							
Bridgeport	100	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
199BP:							
Bridgeport	100	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
199CD:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
199KO:							
Kim	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.84	Slope	0.84	Slope	0.84
Otero	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.84	Slope	0.84	Slope	0.84
						Seepage	0.50

SANITARY FACILITIES--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
199KU:							
Kuma	100	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
199MC:							
Manter	100	Not limited		Not limited		Somewhat limited	
						Seepage	0.50
203MM:							
Campus	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.04	Slope	0.04
		Slope	0.04				
Canlon	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.96	Slope	0.96
		Slope	0.96				
An:							
Bridgeport	100	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
Bl:							
Badland	100	Not rated		Not rated		Not rated	
Bp:							
Bridgeport	100	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
Bv:							
Angelus	100	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
CAA:							
Caruso	100	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.47
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Cc:							
Colby	100	Not limited		Not limited		Not limited	
Cd:							
Colby	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	0.16
COD:							
Colby	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.37	Slope	0.37	Slope	0.37
Dw:							
Dwyer	100	Very limited		Somewhat limited		Very limited	
		Too Sandy	1.00	Slope	0.84	Too Sandy	1.00
		Slope	0.84			Seepage	1.00
						Slope	0.84
Ea:							
Elkader	100	Not limited		Not limited		Not limited	
Eb:							
Elkader	100	Not limited		Not limited		Not limited	
Ec:							
Elkader	100	Not limited		Not limited		Not limited	
Ed:							
Elkader	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	0.16
Gr:							
Schamber	100	Very limited		Very limited		Very limited	
		Too Sandy	1.00	Slope	1.00	Too Sandy	1.00
		Slope	1.00			Seepage	1.00
						Gravel content	1.00
						Slope	1.00
Ka:							
Keith	100	Not limited		Not limited		Not limited	
Kb:							
Keith	100	Not limited		Not limited		Not limited	
Lb:							
Las	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too Sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Depth to saturated zone	0.47
		Too Sandy	1.00				
Ld:							
Las Animas	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too Sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Depth to saturated zone	0.68
		Too Sandy	1.00				

SANITARY FACILITIES--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Lk:							
Likes	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too Sandy	1.00			Too Sandy	0.50
Ll:							
Lincoln	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too Sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00		
		Too Sandy	1.00				
Lm:							
Midway	100	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Ln:							
Simeon	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too Sandy	1.00
		Too Sandy	1.00	Slope	0.16	Seepage	1.00
		Slope	0.16			Slope	0.16
Lo:							
Pleasant	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50
Lu:							
Lubbock	100	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Mh:							
Manter	100	Not limited		Not limited		Somewhat limited	
						Seepage	0.50
Mk:							
Manter	100	Not limited		Not limited		Somewhat limited	
						Seepage	0.50
Mn:							
Manvel	100	Not limited		Not limited		Not limited	
Mp:							
Minnequa	60	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
Penrose	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Ot:							
Otero	100	Not limited		Not limited		Somewhat limited	
						Seepage	0.50
Po:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Pr:							
Limon	100	Not limited		Not limited		Very limited	
						Hard to compact	1.00
Ps:							
Limon	100	Not limited		Not limited		Very limited	
						Hard to compact	1.00
Pt:							
Razor	100	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Hard to compact	1.00
						Depth to bedrock	1.00
Ra:							
Ness	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
Rc:							
Richfield	100	Not limited		Not limited		Not limited	
SMH:							
Smoky Hill River	100	Not rated		Not rated		Not rated	
Ua:							
Ulysses	100	Not limited		Not limited		Not limited	
Ub:							
Ulysses	100	Not limited		Not limited		Not limited	

SANITARY FACILITIES--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Uc:							
Ulysses	100	Not limited		Not limited		Not limited	
UCC:							
Ulysses	100	Not limited		Not limited		Not limited	
Ud:							
Ulysses	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	0.16
Uh:							
Ulysses	100	Not limited		Not limited		Not limited	
Ul:							
Ulysses	70	Not limited		Not limited		Not limited	
Colby	30	Not limited		Not limited		Not limited	
Um:							
Ulysses	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	0.16
Colby	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.16	Slope	0.16	Slope	0.16
Vl:							
Goshen	100	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
Vs:							
Goshen	70	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
Drummond	30	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Seepage	1.00	Flooding	0.40		
		Flooding	0.40				
W:							
Water	100	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Wa:							
Sweetwater	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.96
		Seepage	1.00	Seepage	1.00	Too Sandy	0.50
		Too Sandy	1.00				

AGRICULTURAL WASTE MANAGEMENT
Logan County, Kansas

The nature of the soil is also important in the application of organic wastes and wastewater to land as fertilizers and irrigation; it is also important when the soil is used as a medium for treatment and disposal of these wastes. Favorable soil properties are required to prevent environmental damage.

The use of organic wastes and wastewater as production resources will result in energy conservation, prevent the waste of these important resources, and prevent problems associated with their disposal. Where disposal is the goal, and a maximum amount is disposed in a minimum area to hold costs to a minimum, risk of environmental damage is the principal constraint. Where the reuse goal is pursued, and a minimum amount is applied to a maximum area to obtain the greatest benefit, environmental damage is unlikely.

Interpretations developed for waste management may include ratings for (1) manure and food processing wastes; (2) municipal sewage sludge; (3) irrigation use of wastewater; or (4) treatment of wastewater by the slow rate process, overland flow process, or rapid infiltration process. If available, these should be located in this subsection.

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

The Ag–Waste tables show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food–processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food–processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food–processing wastewater or domestic or animal waste. Domestic and food–processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, phosphorus, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food–processing waste, application of sewage sludge, and disposal of wastewater by irrigation)and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are generally favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food–processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food–processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food–processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density.The wind erodibility group, the soil erodibility factor K, and slope are consideredin estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

AGRICULTURAL WASTE MANAGEMENT
Logan County, Kansas

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding.

The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

See the National Soil Handbook, September 1992, Part 620, for criteria used in rating soils for sanitary facilities and waste management.

AGRICULTURAL WASTE MANAGEMENT--Continued
Logan County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
063CC:							
Campus	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	0.46	Depth to bedrock	0.46	Too steep for surface application	0.91
		Droughty	0.06	Droughty	0.06	Depth to bedrock	0.46
						Droughty	0.06
						Too steep for sprinkler application	0.02
Canlon	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Droughty	1.00	Droughty	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Runoff limitation	0.40			Too steep for sprinkler application	1.00
063EC:							
Elkader	100	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.31
063ED:							
Elkader	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Too steep for surface application	1.00
						Too steep for sprinkler application	0.59
Manvel	45	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	1.00
		Slope	0.00	Slope	0.00	Restricted permeability	0.22
						Too steep for sprinkler application	0.10
063IN:							
Inavale	100	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Leaching limitation	0.45	Droughty	0.14	Droughty	0.14
		Droughty	0.14				
063MB:							
Manvel	65	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	1.00
		Slope	0.00	Slope	0.00	Restricted permeability	0.22
						Too steep for sprinkler application	0.10
Badland	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Low adsorption	1.00	Low adsorption	1.00	Low adsorption	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
063RB:							
Roxbury	100	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
063UD:							
Ulysses	100	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.00	Slope	0.00	Too steep for surface application	1.00

AGRICULTURAL WASTE MANAGEMENT--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
						Too steep for sprinkler application	0.10
063UE:							
Ulysses	100	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.08
171AN:							
Bridgeport	100	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
171MM:							
Campus	75	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.65	Depth to bedrock	0.65	Too steep for surface application	1.00
		Slope	0.16	Slope	0.16	Depth to bedrock	0.65
		Droughty	0.14	Droughty	0.14	Too steep for sprinkler application	0.39
						Droughty	0.14
Canlon	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Depth to bedrock	0.99	Depth to bedrock	0.99	Too steep for sprinkler application	1.00
		Droughty	0.72	Droughty	0.72	Depth to bedrock	0.99
		Runoff limitation	0.40			Droughty	0.72
181RH:							
Rough Broken Land	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Too steep for surface application	1.00
						Too steep for sprinkler application	0.89
Gravelly Land	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Filtering capacity	0.00	Filtering capacity	0.00	Too steep for sprinkler application	1.00
						Filtering capacity	0.00
193CD:							
Colby	100	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Too steep for surface application	1.00
						Too steep for sprinkler application	0.59
193US:							
Ulysses	100	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.31
199BB:							
Bankard	100	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Leaching limitation	0.45				
199BC:							
Bankard	100	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Leaching limitation	0.45	Droughty	0.42	Droughty	0.42
		Droughty	0.42	Flooding	0.40		
199BO:							
Bridgeport	100	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60

AGRICULTURAL WASTE MANAGEMENT--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
199BP:							
Bridgeport	100	Not limited		Somewhat limited		Not limited	
				Flooding	0.40		
199CD:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Runoff limitation	0.40			Too steep for sprinkler application	1.00
199KO:							
Kim	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Too steep for surface application	1.00
						Too steep for sprinkler application	0.89
Otero	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.84	Slope	0.84	Too steep for surface application	1.00
		Filtering capacity	0.00	Filtering capacity	0.00	Too steep for sprinkler application	0.89
						Filtering capacity	0.00
199KU:							
Kuma	100	Not limited		Not limited		Not limited	
199MC:							
Manter	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Filtering capacity	0.00	Filtering capacity	0.00	Too steep for surface application	0.08
						Filtering capacity	0.00
203MM:							
Campus	60	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.46	Depth to bedrock	0.46	Too steep for surface application	1.00
		Droughty	0.06	Droughty	0.06	Depth to bedrock	0.46
		Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
						Droughty	0.06
Canlon	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.96	Slope	0.96	Too steep for surface application	1.00
		Runoff limitation	0.40			Too steep for sprinkler application	0.97
An:							
Bridgeport	100	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
Bl:							
Badland	100	Not rated		Not rated		Not rated	
Bp:							
Bridgeport	100	Not limited		Somewhat limited		Not limited	
				Flooding	0.40		
Bv:							
Angelus	100	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
CAA:							
Caruso	100	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.86	Flooding	1.00	Depth to saturated zone	0.86
		Flooding	0.60	Depth to saturated zone	0.86	Flooding	0.60

AGRICULTURAL WASTE MANAGEMENT--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Cc:							
Colby	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
Cd:							
Colby	100	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.39
COD:							
Colby	100	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.59
Dw:							
Dwyer	100	Very limited Filtering capacity Slope Leaching limitation Droughty	1.00 0.84 0.45 0.24	Very limited Filtering capacity Slope Droughty	1.00 0.84 0.24	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application Droughty	1.00 1.00 0.89 0.24
Ea:							
Elkader	100	Not limited		Not limited		Not limited	
Eb:							
Elkader	100	Not limited		Not limited		Not limited	
Ec:							
Elkader	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
Ed:							
Elkader	100	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.39
Gr:							
Schamber	100	Very limited Filtering capacity Slope Droughty Leaching limitation	1.00 1.00 1.00 0.45	Very limited Filtering capacity Slope Droughty	1.00 1.00 1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application Droughty	1.00 1.00 1.00 1.00
Ka:							
Keith	100	Not limited		Not limited		Not limited	
Kb:							
Keith	100	Not limited		Not limited		Not limited	
Lb:							
Las	100	Very limited Filtering capacity Depth to saturated zone Flooding Restricted permeability	1.00 0.86 0.60 0.30	Very limited Filtering capacity Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.86 0.22	Very limited Filtering capacity Depth to saturated zone Flooding Restricted permeability	1.00 0.86 0.60 0.22
Ld:							
Las Animas	100	Very limited		Very limited		Very limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Filtering capacity	1.00	Flooding	1.00	Filtering capacity	1.00
		Depth to saturated zone	0.95	Filtering capacity	1.00	Depth to saturated zone	0.95
		Flooding	0.60	Depth to saturated zone	0.95	Flooding	0.60
Lk:							
Likes	100	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Droughty	1.00	Droughty	1.00	Droughty	1.00
		Leaching limitation	0.45				
Ll:							
Lincoln	100	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Droughty	0.96	Droughty	0.96	Droughty	0.96
		Leaching limitation	0.45				
Lm:							
Midway	100	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Runoff limitation	0.40			Too steep for sprinkler application	1.00
Ln:							
Simeon	100	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Leaching limitation	0.45	Slope	0.16	Too steep for surface application	1.00
		Slope	0.16	Droughty	0.13	Too steep for sprinkler application	0.39
		Droughty	0.13			Droughty	0.13
Lo:							
Pleasant	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff limitation	0.40				
Lu:							
Lubbock	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
Mh:							
Manter	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Filtering capacity	0.00	Filtering capacity	0.00	Filtering capacity	0.00
Mk:							
Manter	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Filtering capacity	0.00	Filtering capacity	0.00	Too steep for surface application	0.08
						Filtering capacity	0.00
Mn:							
Manvel	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
						Too steep for surface application	0.00
Mp:							
Minnequa	60	Somewhat limited		Somewhat limited		Somewhat limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Depth to bedrock	0.46	Depth to bedrock	0.46	Too steep for surface application	0.91
		Droughty	0.13	Droughty	0.13	Depth to bedrock	0.46
						Droughty	0.13
						Too steep for sprinkler application	0.02
Penrose	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Runoff limitation	0.40			Too steep for sprinkler application	1.00
Ot:							
Otero	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Filtering capacity	0.00	Filtering capacity	0.00	Too steep for surface application	0.66
						Filtering capacity	0.00
						Too steep for sprinkler application	0.00
Po:							
Canyon	100	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Runoff limitation	0.40			Too steep for sprinkler application	1.00
Pr:							
Limon	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Salinity	0.01	Salinity	0.13	Salinity	0.13
						Too steep for surface application	0.00
Ps:							
Limon	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Salinity	0.01	Salinity	0.13	Salinity	0.13
Pt:							
Razor	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Sodium content	0.08	Sodium content	0.08	Sodium content	0.08
						Too steep for surface application	0.08
Ra:							
Ness	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff limitation	0.40				
Rc:							
Richfield	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
SMH:							
Smoky Hill River	100	Not rated		Not rated		Not rated	

AGRICULTURAL WASTE MANAGEMENT--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ua:							
Ulysses	100	Not limited		Not limited		Not limited	
Ub:							
Ulysses	100	Not limited		Not limited		Not limited	
Uc:							
Ulysses	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
UCC:							
Ulysses	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.31
Ud:							
Ulysses	100	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.39
Uh:							
Ulysses	100	Not limited		Not limited		Not limited	
Ul:							
Ulysses	70	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
Colby	30	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
Um:							
Ulysses	60	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.39
Colby	40	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.39
Vl:							
Goshen	100	Not limited		Somewhat limited Flooding	0.40	Not limited	
Vs:							
Goshen	70	Not limited		Somewhat limited Flooding	0.40	Not limited	
Drummond	30	Very limited Restricted permeability Droughty Runoff limitation Salinity	1.00 0.94 0.40 0.01	Very limited Restricted permeability Droughty Flooding	1.00 0.94 0.40	Very limited Restricted permeability Droughty	1.00 0.94
W:							
Water	100	Very limited Slope Low adsorption	1.00 1.00	Very limited Low adsorption Slope	1.00 1.00	Very limited Low adsorption Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00
Wa:							
Sweetwater	100	Very limited Filtering capacity Depth to saturated zone Flooding	1.00 1.00 0.60	Very limited Filtering capacity Flooding Depth to saturated zone	1.00 1.00 1.00	Very limited Filtering capacity Depth to saturated zone Flooding	1.00 1.00 0.60

AGRICULTURAL WASTE MANAGEMENT--Continued
Logan County, Kansas

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Map symbol and soil name	Pct of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Runoff limitation	0.40	Restricted permeability	0.22	Restricted permeability	0.22
		Restricted permeability	0.30				

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Logan County, Kansas: KS109

MUSYM/SEQ#	COMPONENT/TEXTURE/MU%	HYD	KFACT	SURFACE DEPTH	% OM	SPISP II Ratings: Leaching (SLP)	Solution Runoff (SSRP)	Adsorbed Runoff (SARP)
063CC 1	CAMPUS SICL 60%	B	0.28	5"	1.5%	H	I	I
063CC 2	CANLON L 40%	D	0.32	4"	1.3%	V	H	H (s)
063ED 1	ELKADER SIL 55%	B	0.32	9"	2.0%	I	I	I
063ED 2	MANVEL SIL 45%	B	0.37	3"	1.3%	H	I	I
063IN 1	INAVALE LS 100%	A	0.17	7"	0.8%	H	L	L
063KP 1	KIM CL 60%	B	0.28	5"	0.8%	H	I	I
063KP 2	PENDEN CL 40%	B	0.28	10"	2.5%	I	I	I
063MB 1	MANVEL SIL 65%	B	0.37	3"	1.3%	H	I	I
063MB 2	BADLAND SIL 35%		0.00	1"	0.0%	?	?	?
063RB 1	ROXBURY SIL 100%	B	0.32	24"	3.0%	L	I	I
063UE 1	ULYSSES SIL 100%	B	0.32	10"	2.0%	I	I	I
171AN 1	BRIDGEPORT L 100%	B	0.28	12"	2.0%	I	I	I
171MM 1	MANSKER L 75%	B	0.28	7"	0.8%	H	I	I
181RH 1	ROUGH BROKEN LAND L 65%	B	0.32	6"	0.8%	H	I	H (s)
181RH 2	GRAVELLY LAND SL 35%	B	0.24	14"	1.3%	I	I	H (s)
199BB 1	BANKARD LS 100%	A	0.17	5"	0.8%	H	L	L
199BC 1	BANKARD SL 100%	A	0.24	5"	1.5%	H	L	L
199BO 1	BRIDGEPORT L 100%	B	0.32	16"	2.5%	I	I	I
199BP 1	BRIDGEPORT SIL 100%	B	0.32	13"	2.5%	I	I	I
199KO 1	KIM L 70%	B	0.32	6"	0.8%	H	I	H (s)
199KO 2	OTERO SL 30%	B	0.24	5"	1.3%	H	I	H (s)
199KU 1	KUMA SIL 100%	B	0.32	8"	3.0%	I	I	I
203MM 1	CAMPUS L 60%	B	0.28	8"	1.3%	I	I	I
203MM 2	CANLON L 40%	D	0.32	4"	1.3%	V	H	H (s)
An 1	BRIDGEPORT SIL 100%	B	0.32	12"	2.5%	I	I	I
Bl 1	BADLAND 100%		0.00	0"	0.0%	?	?	?
Bp 1	BRIDGEPORT L 100%	B	0.32	18"	2.5%	L	I	I
Bv 1	ANGELUS SIL 100%	B	0.37	6"	1.0%	H	I	I

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Logan County, Kansas: KS109

CAA 1	CARUSO L 100%	C	0.28	16"	2.5% H (w)	H	H
Cc 1	COLBY SIL 100%	B	0.43	5"	1.3% H	I	I
Cd 1	COLBY SIL 100%	B	0.43	5"	1.3% H	I	I
Dw 1	DWYER LFS 100%	A	0.17	5"	2.0% H	L	I (s)
Ea 1	ELKADER SIL 100%	B	0.32	15"	2.0% I	I	I
Eb 1	ELKADER SIL 100%	B	0.32	15"	2.0% I	I	I
Ec 1	ELKADER SIL 100%	B	0.32	15"	2.0% I	I	I
Ed 1	ELKADER SIL 100%	B	0.32	15"	2.0% I	I	I
Gr 1	SCHAMBER GR-SL 100%	A	0.17	6"	1.3% H	L	I (s)
Ka 1	KEITH SIL 100%	B	0.32	11"	2.0% I	I	I
Kb 1	KEITH SIL 100%	B	0.32	11"	2.0% I	I	I
Lb 1	LAS L 100%	C	0.32	8"	0.5% H (w)	H	H
Ld 1	LAS ANIMAS FSL 100%	C	0.24	29"	1.3% H (w)	H	H
Lk 1	LIKES LFS 100%	A	0.17	10"	0.5% H	L	L
Ll 1	LINCOLN LS 100%	A	0.17	10"	0.5% H	L	L
Lm 1	MIDWAY C 100%	D	0.32	2"	1.3% V	H	H (s)
Ln 1	SIMEON LS 100%	A	0.17	12"	0.8% H	L	L
Lo 1	PLEASANT SICL 100%	D	0.37	8"	3.5% H (w)	H	H
Lu 1	LUBBOCK SIL 100%	B	0.32	10"	2.0% I	I	I
Mh 1	MANTER FSL 100%	B	0.20	17"	0.8% H	I	I
Mk 1	MANTER FSL 100%	B	0.20	14"	3.0% I	I	I
Mn 1	MANVEL SIL 100%	B	0.37	3"	1.3% H	I	I
Mp 1	MANVEL SIL 60%	C	0.37	3"	1.3% L	H	H
Mp 2	PENROSE L 40%	D	0.32	6"	0.8% V	H	H (s)
Ot 1	OTERO FSL 100%	B	0.24	16"	1.3% I	I	I
Po 1	CANYON L 100%	D	0.32	5"	0.8% V	H	H (s)
Pr 1	LIMON C 100%	C	0.24	8"	0.8% I	H	H
Ps 1	LIMON C 100%	C	0.24	8"	0.8% I	H	H
Pt 1	RAZOR C 100%	C	0.37	8"	1.3% L	H	H
Ra 1	NESS C 100%	D	0.28	60"	2.0% H (w)	H	H

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Logan County, Kansas: KS109

Rc 1	RICHFIELD SIL 100%	B	0.32	5"	2.0% I	I	I
SMH 1	SMOKY HILL RIVER S 100%	D	0.00	6"	0.1% H (w)	H	L
Ua 1	ULYSSES SIL 100%	B	0.32	7"	2.0% I	I	I
Ub 1	ULYSSES SIL 100%	B	0.32	7"	2.0% I	I	I
Uc 1	ULYSSES SIL 100%	B	0.32	7"	2.0% I	I	I
Ud 1	ULYSSES SIL 100%	B	0.32	7"	2.0% I	I	I
Uh 1	ULYSSES SICL 100%	B	0.32	6"	2.0% I	I	I
Ul 1	COLBY SIL 70%	B	0.43	5"	1.3% H	I	I
Ul 2	ULYSSES SIL 30%	B	0.32	7"	2.0% I	I	I
Um 1	ULYSSES SIL 60%	B	0.32	7"	2.0% I	I	I
Um 2	COLBY SIL 40%	B	0.43	5"	1.3% H	I	I
Vl 1	GOSHEN SIL 100%	B	0.32	16"	2.0% I	I	I
Vs 1	GOSHEN SIL 70%	B	0.32	16"	2.0% I	I	I
Vs 2	DRUMMOND SIL 30%	D	0.49	5"	0.8% H (w)	H	H
Wa 1	SWEETWATER CL 100%	D	0.28	24"	2.5% H (w)	H	H

(.\REPORTS\SOILS.TXT generated on 12/12/01 at 12:11:15)

H -- High
I -- Intermediate
L -- Low
V -- Very Low

Conditions that affect ratings:
    m   -- There are macropores in the surface horizon deeper than 24"
    w   -- The high water table comes within 24" of the surface during the growing season
    s   -- The field slope is greater than 15%

SPISP II S-Ratings:
   SLP   -- Soil Leaching Potential
   SSRP -- Soil Solution Runoff Potential
   SARP -- Soil Adsorbed Runoff Potential

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Logan County, Kansas

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed. The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA, 1999) and "Keys to Soil Taxonomy"' (USDA, 1998) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units in the Hydric Soil Interpretations table meet the definition of hydric soils and, in addition, have at east one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

These map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Logan County, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
063CC: CAMPUS-CANLON COMPLEX, 3 TO 40 PERCENT SLOPES	CAMPUS	No	hillslope	---	---	---	---
	CANLON	No	escarpment	---	---	---	---
	UNNAMED HYDRIC SOILS	Yes	drainageway	2A	YES	NO	NO
063EC: ELKADER SILT LOAM, 3 TO 6 PERCENT SLOPES	ELKADER	No	fan	---	---	---	---
063ED: ELKADER AND MANVEL SILT LOAMS, 6 TO 15 PERCENT SLOPES	ELKADER	No	fan	---	---	---	---
	MANVEL	No	fan	---	---	---	---
063IN: INAVALE SOILS, FREQUENTLY FLOODED	INAVALE	No	flood plain	---	---	---	---
063MB: MANVEL-BADLAND COMPLEX, 6 TO 40 PERCENT SLOPES	MANVEL	No	fan	---	---	---	---
	BADLAND	Unranked	erosion remnant	---	---	---	---
063RB: ROXBURY SOILS, FREQUENTLY FLOODED	ROXBURY	No	flood plain	---	---	---	---
	UNNAMED HYDRIC SOILS	Yes	flood plain	2B3,4	YES	YES	NO
063UD: ULYSSES SILT LOAM, 6 TO 10 PERCENT SLOPES	ULYSSES	No	hillslope	---	---	---	---
063UE: ULYSSES-COLBY COMPLEX, 2 TO 6 PERCENT SLOPES	ULYSSES	No	hillslope	---	---	---	---
171AN: BRIDGEPORT LOAM, CHANNELED	BRIDGEPORT	No	flood plain	---	---	---	---
171MM: CAMPUS-CANLON LOAMS, 5 TO 30 PERCENT SLOPES	CAMPUS	No	hillslope	---	---	---	---
	CANLON	No	break	---	---	---	---
181RH: KIM-OTERO COMPLEX, 6 TO 25 PERCENT SLOPES	ROUGH BROKEN LAND	No	hillslope	---	---	---	---
	GRAVELLY LAND	No	hillslope	---	---	---	---
	UNNAMED HYDRIC SOILS	Yes	drainageway	2A	YES	NO	NO
193CD: COLBY SILT LOAM, 7 TO 15 PERCENT SLOPES	COLBY	No	hillslope	---	---	---	---
193US: ULYSSES SILT LOAM, 3 TO 7 PERCENT SLOPES	ULYSSES	No	hillslope	---	---	---	---
199BB: BANKARD LOAMY SAND, OCCASIONALLY FLOODED	BANKARD	No	flood plain	---	---	---	---
199BC: BANKARD SANDY LOAM, RARELY FLOODED	BANKARD	No	flood plain	---	---	---	---
199BO: BRIDGEPORT LOAM, OCCASIONALLY FLOODED	BRIDGEPORT	No	flood plain	---	---	---	---
	UNNAMED HYDRIC SOILS	Yes	flood plain	2B3	YES	NO	NO
199BP: BRIDGEPORT SILT LOAM, 0 TO 2 PERCENT SLOPES, RARELY FLOODED	BRIDGEPORT	No	flood plain	---	---	---	---
199CD: CANYON LOAM, 5 TO 30 PERCENT SLOPES	CANYON	No	hillslope	---	---	---	---
	UNNAMED HYDRIC SOILS	Yes	drainageway	2A	YES	NO	NO
199KO: KIM-OTERO COMPLEX, 5 TO 20 PERCENT SLOPES	KIM	No	hillslope	---	---	---	---
	OTERO	No	hillslope	---	---	---	---
	UNNAMED HYDRIC SOILS	---	---	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Logan County, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
199KU:							
KUMA SILT LOAM, 0 TO 1 PERCENT SLOPES	KUMA	No	flat	---	---	---	---
	PLEASANT	Yes	depression	3	NO	NO	YES
199MC:							
MANTER FINE SANDY LOAM, 2 TO 5 PERCENT SLOPES	MANTER	No	plain	---	---	---	---
203MM:							
CAMPUS-CANLON COMPLEX, 3 TO 25 PERCENT SLOPES	CAMPUS	No	plain	---	---	---	---
	CANLON	No	plain	---	---	---	---
An:							
BRIDGEPORT SILT LOAM, CHANNELED	BRIDGEPORT	No	terrace	---	---	---	---
Bl:							
BADLAND	BADLAND	Unranked	erosion remnant	---	---	---	---
Bp:							
BRIDGEPORT LOAM, RARELY FLOODED	BRIDGEPORT	No	alluvial fan, flood plain	---	---	---	---
Bv:							
ANGELUS SILT LOAM, OCCASIONALLY FLOODED	ANGELUS	No	flood plain	---	---	---	---
CAA:							
CARUSO LOAM, OCCASIONALLY FLOODED	CARUSO	No	flood plain	---	---	---	---
	SWEETWATER	Yes	flood plain	2B3	YES	NO	NO
Cc:							
COLBY SILT LOAM, 3 TO 5 PERCENT SLOPES	COLBY	No	hillslope	---	---	---	---
Cd:							
COLBY SILT LOAM, 5 TO 15 PERCENT SLOPES	COLBY	No	drainageway	---	---	---	---
COD:							
COLBY SILT LOAM, 6 TO 15 PERCENT SLOPES	COLBY	No	hillslope	---	---	---	---
Dw:							
DWYER LOAMY FINE SAND, 3 TO 8 PERCENT SLOPES	DWYER	No	dune	---	---	---	---
Ea:							
ELKADER SILT LOAM, 0 TO 1 PERCENT SLOPES	ELKADER	No	flat	---	---	---	---
Eb:							
ELKADER SILT LOAM, 1 TO 3 PERCENT SLOPES	ELKADER	No	fan	---	---	---	---
Ec:							
ELKADER SILT LOAM, 3 TO 5 PERCENT SLOPES	ELKADER	No	hillslope	---	---	---	---
Ed:							
ELKADER SILT LOAM, 5 TO 15 PERCENT SLOPES	ELKADER	No	hillslope	---	---	---	---
Gr:							
SCHAMBER GRAVELLY SANDY LOAM, 5 TO 25 PERCENT SLOPES	SCHAMBER	No	drainageway	---	---	---	---
Ka:							
KEITH SILT LOAM, 0 TO 1 PERCENT SLOPES	KEITH	No	plain	---	---	---	---
	LOFTON	Yes	depression	3	NO	NO	YES
Kb:							
KEITH SILT LOAM, 1 TO 3 PERCENT SLOPES	KEITH	No	plain	---	---	---	---
	PLEASANT	Yes	depression	3	NO	NO	YES
Lb:							
LAS LOAM, MODERATELY DEEP, OCCASIONALLY FLOODED	LAS	No	flood plain	---	---	---	---
	WET ALLUVIAL LAND	Yes	flood plain	2B2	YES	NO	NO
Ld:							
LAS ANIMAS SANDY LOAM, OCCASIONALLY FLOODED	LAS ANIMAS	No	flood plain	---	---	---	---
Lk:							
LIKES LOAMY FINE SAND, 0 TO 2 PERCENT SLOPES	LIKES	No	fan	---	---	---	---
Ll:							
LINCOLN SOILS, OCCASIONALLY FLOODED	LINCOLN	No	flood plain	---	---	---	---
Lm:							
MIDWAY CLAY, 5 TO 30 PERCENT SLOPES	MIDWAY	No	hillslope	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Logan County, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Ln:							
SIMEON LOAMY SAND, 5 TO 15 PERCENT SLOPES	SIMEON	No	drainageway	---	---	---	---
Lo:							
PLEASANT SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES	PLEASANT	Yes	playa	3	NO	NO	YES
Lu:							
LUBBOCK SILT LOAM, 0 TO 1 PERCENT SLOPES	LUBBOCK	No	alluvial flat	---	---	---	---
	LOFTON	Yes	depression	3	NO	NO	YES
Mh:							
MANTER FINE SANDY LOAM, 1 TO 3 PERCENT SLOPES	MANTER	No	paleoterrace, sand sheet	---	---	---	---
Mk:							
MANTER FINE SANDY LOAM, 3 TO 5 PERCENT SLOPES	MANTER	No	plain	---	---	---	---
Mn:							
MANVEL SILT LOAM, 1 TO 5 PERCENT SLOPES	MANVEL	No	fan	---	---	---	---
Mp:							
MINNEQUA-PENROSE SILT LOAMS, 5 TO 15 PERCENT SLOPES	MINNEQUA	No	fan	---	---	---	---
	PENROSE	No	hillslope	---	---	---	---
Ot:							
OTERO FINE SANDY LOAM, 4 TO 15 PERCENT SLOPES	OTERO	No	hillslope	---	---	---	---
Po:							
CANYON LOAM, 5 TO 35 PERCENT SLOPES	CANYON	No	escarpment	---	---	---	---
	UNNAMED HYDRIC SOILS	Yes	drainageway	2A	YES	NO	NO
Pr:							
LIMON CLAY, 0 TO 1 PERCENT SLOPES	LIMON	No	fan remnant	---	---	---	---
Ps:							
LIMON CLAY, 1 TO 3 PERCENT SLOPES	LIMON	No	fan remnant	---	---	---	---
Pt:							
RAZOR CLAY, 3 TO 5 PERCENT SLOPES	RAZOR	No	hillslope	---	---	---	---
Ra:							
NESS CLAY	NESS	Yes	playa	2B3,3	YES	NO	YES
Rc:							
RICHFIELD SILT LOAM, 0 TO 1 PERCENT SLOPES	RICHFIELD	No	plain	---	---	---	---
SMH:							
SMOKY HILL RIVER	SMOKY HILL RIVER	Unranked	---	---	---	---	---
	UNNAMED HYDRIC SOILS	Yes	drainageway	2B3	YES	NO	NO
Ua:							
ULYSSES SILT LOAM, 0 TO 1 PERCENT SLOPES	ULYSSES	No	ridge	---	---	---	---
Ub:							
ULYSSES SILT LOAM, 1 TO 3 PERCENT SLOPES	ULYSSES	No	ridge	---	---	---	---
Uc:							
ULYSSES SILT LOAM, 3 TO 5 PERCENT SLOPES	ULYSSES	No	hillslope	---	---	---	---
UCC:							
ULYSSES SILT LOAM, 3 TO 6 PERCENT SLOPES	ULYSSES	No	plain	---	---	---	---
Ud:							
ULYSSES SILT LOAM, 5 TO 15 PERCENT SLOPES	ULYSSES	No	hillslope	---	---	---	---
Uh:							
ULYSSES SILTY CLAY LOAM, 1 TO 3 SLOPES	ULYSSES	No	ridge	---	---	---	---
Ul:							
ULYSSES-COLBY SILT LOAMS, 3 TO 5 PERCENT SLOPES, ERODED	ULYSSES	No	hillslope	---	---	---	---
	COLBY	No	hillslope	---	---	---	---
Um:							
ULYSSES-COLBY SILT LOAMS, 5 TO 15 PERCENT SLOPES, ERODED	ULYSSES	No	hillslope	---	---	---	---
	COLBY	No	hillslope	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Logan County, Kansas

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Vl:							
GOSHEN SILT LOAM, RARELY FLOODED	GOSHEN	No	terrace	---	---	---	---
Vs:							
GOSHEN-DRUMMOND COMPLEX, RARELY FLOODED	GOSHEN	No	terrace	---	---	---	---
	DRUMMOND	No	terrace	---	---	---	---
W:							
WATER	WATER	Unranked	---	---	---	---	---
Wa:							
SWEETWATER CLAY LOAM, OCCASIONALLY FLOODED	SWEETWATER	Yes	flood plain	2B3	YES	NO	NO

FOOTNOTE: There may be small areas of included soils or miscellaneous areas that are significant to use and management of the soil; yet are too small to delineate on the soil map at the map's original scale. These may be designated as spot symbols and are defined in the published Soil Survey Report or the USDA-NRCS Technical Guide, Part II.
Areas mapped as water or any map unit that contains one of the following conventional symbols is considered a hydric soil map unit: marshes or swamps; wet spots; depressions; streams, lakes and ponds.

1. All Histosols except Folists, or

2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Pachic subgroups, or Cumulic subgroups that are:

   a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or

   b. poorly drained or very poorly drained and have either:

      (1) water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in),

      or for other soils

      (2) water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or

      (3) water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or

3. Soils that are frequently ponded for long duration or very long duration during the growing season, or

4. Soils that are frequently flooded for long duration or very long duration during the growing season.